

The Canadian Medical Association Journal

Vol. XVI

TORONTO, AUGUST, 1926

No. 8

MEDICAL RESEARCH*

By F. G. BANTING

Chair of Medical Research, University of Toronto

THERE is no more important phase of medical science than medical research. Were it not for medical research there would be no excuse for the existence of the Canadian Medical Association or need for annual meetings.

Medical research is a broad field. Having been a practitioner myself and realizing the difficulties that must be overcome in the transaction of research, I have endeavoured in this paper to treat the subject of medical research from the standpoint of a general practitioner in the hope that helpful suggestions may be given to all such who are here to-day.

Medical research presents problems for the chemist, the biochemist, the physicist, the biologist, the economist, but closer than any of these, for the physician. Most of the outstanding contributions to medical science have been made by general practitioners. Harvey, Sydenham, Addison, and James MacKenzie were not only outstanding physicians of their own day, but because of research work their names will live. We have but to read the writings of such men to learn the secret of their success. They were invariably workers and thinkers, and accurate observers. They observed every sign and symptom of disease, and then by weight of clinical experience made deductions and elaborated theories. To-day, I think we sometimes get lost in a maze of less important details and lose sight of the main issue. E. I. Scott in 1912, in his search for the internal secretion of the pancreas, endeavoured to ligate the pancreatic

ducts, but not being satisfied with the methods of blood sugar analysis then available, he abandoned his search in order to obtain a more accurate method for the estimation of sugar in the blood. Roux and Yersen were on the verge of producing diphtheria antitoxin, but while they were elaborating details, von Bering made practical use of their theory, and was the first to produce it.

The general practitioner is closely in touch with patients suffering from all manner of diseases. He has the opportunity of making first hand observations of the signs and symptoms of these diseases. I am sure that the older members of the medical profession, had they their lives to live over again, would keep systematic and accurate records of their cases so that this wealth of clinical data could be accurately set forth as a basis of diagnosis, of prognosis and of the relative value of various forms of treatment. Records such as these would also contain a description of the unusual responses after the administration of drugs; the effects of the infectious diseases and other influences in persons suffering from chronic disease; the first symptoms of diseases such as nephritis, Addison's disease, and pernicious anæmia; the gradual development of disease, and the form of treatment employed with its results, beneficial or otherwise. At the time that these records were made they might not appear of value, but memory is variable and inaccurate, and the written record is useful not only for the present but for all time. As an example of the inaccuracy of memory, Saundly tells the follow-

* Delivered before The Canadian Medical Association, Victoria, June, 1926.

ing story of Sir Lawson Tait. Tait made the statement at the Midland Medical Society meeting that he had done one thousand colporrhaphies. Dr. Taylor, a junior on Tait's staff took exception to the number of operations. Tait challenged Taylor to count from the hospital records and to report at the next meeting of the society. The hospital records showed that one hundred and twenty-eight colporrhaphies had been done by Tait. Tait's reply was, "There may be a slight discrepancy in figures, but the facts are the same."

Every number of the *British Medical Journal* contains short reports of unusual cases and of the experiences of physicians. *The Canadian Medical Association Journal* should encourage this practice amongst physicians. These reports may have a three-fold benefit. They help the patient, because the physician makes a more thorough and systematic investigation, if he purposes to report the case. They help the physician because in his working out of the case he gains experience and information. They help the reader because they give him the benefit of the other man's experience.

The general practitioner may feel that he can do but little because he has not adequate laboratory facilities. The Public Health Laboratories scattered through the various provinces endeavour to supply this need. But even without laboratory assistance medical research can be carried on, for its principles are the same inside or outside of the laboratory. *The fundamental principle of medical research is observation, and the laboratory is only secondary to the bedside clinical examination.*

Fothergill gives a vivid picture based on observation, of the chronic bronchitic, as the following extracts show.

"In the out-patient department of a chest hospital the old bronchitic people are still to be seen, a considerable proportion of the whole. With laboured respiration and tardy step they enter puffing and panting, scant of breath, which makes the speech difficult; while a significant shake of the head often tells more eloquently than words of the inward discomfort, and that the breathing is embarrassed. Words they avoid, for the entrance of air often provokes a paroxysm of coughing, and this causes them much distress. They excite one's compassion, albeit they occupy a great deal of time to little

effect; for they are apt to be stupid and to comprehend badly, these folks. Their brains are not very bright with the imperfectly oxygenized blood circulating through them."

"In the wards of the workhouse infirmary they are to be met in larger numbers; quietly keeping their beds when the other patients are up in the day-rooms; usually on their backs, or sitting propped up with pillows. They are a quiet people, having no breath to spare; and if they have to talk, they take a long inspiration before commencing. The abdominal character of their respiration is seen through the bed-clothes; and the accessory muscles in the neck are conspicuous, dragging up the thorax bodily. They constitute a distinct race as compared with their neighbours in the wards. Those who are up are seen sitting with their hands upon the middle of the thigh, so fixing the shoulder as a point for the pectoral muscle to pull from. No folded arms across the chest in repose to these folks. If walking, they stop to talk or answer a question, and the arm is thrown on to the nearest object for the same purpose of fixing the shoulder."

This description illustrates the method used for diagnosis by the physicians of the older school. To-day, when a patient suffering with chronic bronchitis is admitted to hospital a thorough clinical examination is made which may include, inspection, palpation, percussion, auscultation, red blood count, white blood count, differential count of eosinophiles and polymorphonuclear leucocytes, estimation of hæmoglobin, blood sugar, blood chlorides, complete urinalysis, bacteriological examination of sputum and x-ray examinations. These purely mechanical and chemical devices for diagnosis are apt to be over-emphasized in modern medical teaching. Even in practice more and more reliance is being placed on x-ray and laboratory tests. And as a result of these machine-made methods the physician of to-day is doing less thinking and making fewer observations. The older school had not the advantages of the modern school, but the modern school should not overlook the older methods.

Sometimes the most trivial observations are accepted without question, whereas they may prove to be extraordinary in that they may lead to the solution of fundamental principles. Apples had been falling since Adam and Eve

left Eden, but it was not till Newton questioned this ordinary occurrence that the fundamental principle of gravitation was revealed. Since Lænnec introduced the stethoscope thousands of physicians have listened to the human heart, but it was not till MacKenzie by long continued observations learned to interpret the meaning of the changing sounds that we were given a firm basis for the treatment and prognosis of organic diseases of the heart. Mosquitoes had been buzzing and biting thousands of years before Sir Ronald Ross attached to them the blame of transmitting malaria. As early as 1775 there was a common saying among peasants in England that those who had had cowpox would never take smallpox. In the little town of Sodbury, near Bristol, a young country woman came to seek advice. The subject of smallpox was mentioned in her presence and she immediately observed, "I cannot take that disease, for I have had cowpox." This remark fell upon the ears of Edward Jenner. It inspired him to perform experiments which resulted in vaccination being adopted as a preventive against smallpox.

Jenner may have known of a certain farmer, Benjamin Jesty of Yetminster in Dorset, who in 1774 successfully protected his family against smallpox by vaccinating them with cowpox. If he did, it is further proof that the medical profession should not be above scientific facts regardless of their source. Lay people of to-day frequently come forward with such suggestions as, "Workers in lead factories never die of cancer;" "Natives of the Malay States never have appendicitis;" "Natives of St. Domingo, whose diet consists almost exclusively of sugar cane, never have diabetes." These ordinary observations are causing medical men to think and investigate.

A few generations ago epidemics of diphtheria were common and were considered almost inevitable. One of the treatments frequently used consisted in placing a thick slice of fat pork sprinkled with cayenne pepper on the throat. As a child I remember a small cemetery, long since disused, on the outskirts of my home town. This cemetery was the result of an epidemic of diphtheria. Previous to this epidemic there had been no need of a cemetery but the large number of deaths in a short space of time necessitated hasty burial.

Another example of the control of epidemics is shown by a comparison in deaths from typhoid in the Boer War and the Great War. Wright, by his discovery of anti-typhoid vaccine, has, within a few years, reduced typhoid fever to a comparatively rare disease. During the South African campaign 548,000 soldiers served for two years and seven months; out of every 1000 soldiers, 123 contracted typhoid fever; altogether 8248 died of the disease, in other words, more died of typhoid than were killed in action or died of wounds. In the Great War, 420,000 men served for four years and three months; out of every 1000, only one contracted typhoid fever; altogether there were only fourteen deaths from this disease in the whole Canadian Army during the entire war.

Through the energetic activities of public health organizations infectious diseases such as diphtheria, smallpox, scarlet fever and typhoid have been fairly well controlled, and are not causing the loss of human life which they did in past decades. The great problems of the present day are the chronic diseases.

The latest available vital statistics for the Dominion of Canada are those of 1923 in which year the population was 6,632,000. These figures do not include Quebec as the statistics of this province are not given. The total deaths from all causes in this year were 70,182; of these 7,491 were due to diseases of the heart; 3,164 to diseases of the arteries and 2,472 to nephritis; or the immense total of 13,127 deaths due to cardio-vascular renal diseases; whereas pneumonia caused 6,237, cancer 5,157 and tuberculosis 3,481. It is true that physicians in signing the death certificate may favour disease of the heart as the cause of death and that in some cases the primary cause of death is due to other ailments, but this immense figure given for cardio-vascular renal diseases is surely a challenge for medical research. It would be interesting to know if the prevalent removal of teeth, tonsils, appendix and other foci of infection from which inflammatory rheumatism and endocarditis are supposed to arise, will have any effect on the future incidence of cardiac deaths. Cancer, dreadful as it is, accounted for less than one-half as many deaths as cardiac diseases.

From these statistics it is seen that we must gain more knowledge of the cause, course, and

treatment of cardio-vascular renal disease. This can only come about by the concentrated effort of the general practitioner who unlike the specialist has the patient constantly under his care and supervision. The greatest single contribution in this direction was made by a general practitioner. I refer to the work of Sir James MacKenzie.

Advancing civilization introduces new problems in disease which challenge medical science. The white man desired materials from the tropics; he wanted his coffee, rubber and bananas, which only grew in the tropics. But tropical diseases prevented his advance. For commercial purposes the white man required a canal through Central America to connect the Atlantic with the Pacific. French engineers commenced the construction but were forced to abandon it because of hook-worm, yellow fever, and malaria. The present Panama Canal is a monument not only to modern engineering but to medical science. During the summer of 1924 the delegates of the International Health Conference passed over approximately 120 miles of railroad which is said to have cost one man per tie as a toll of human life during its construction. Since the building of the railroad and the time of De Lesseps, Sir Ronald Ross showed that malaria was transmitted by the mosquito. Reed, Carroll, Lazear and Agramonte then showed that yellow fever was also transmitted by the mosquito, and by the eradication of this pest the canal zone was rendered safe for human habitation.

New industries introduce new factors in the medical care of workmen. Mining with its drilling and blasting, and its extraction of minerals with poisonous acids, and industries where lead, arsenic, and antimony are used, have given rise to the creation of a special department in medicine. The proportionate increase in the population of the cities with the consequent aggregation of citizens has only been made possible by control of epidemics, and through the development of sanitation and public health organization. The modern living conditions in large cities frequently produce malnutrition and general debility amongst children of all ages and classes, thus giving rise to new problems for the medical profession.

To-day pernicious anæmia, organic diseases of the heart, cancer, pneumococcal peritonitis,

and Addison's disease, and almost the whole category of mental derangements are being accepted as incurable. Let us hope that the next generation will see some at least of these conquered by medical science.

Problems involving a special disease can best be undertaken in a university because of their libraries, their laboratory facilities and, greatest of all, because of the advice and guidance of outstanding men at the head of teaching departments. Few of these problems can be solved in any one department and they therefore require co-operation among various departments. The work on insulin was commenced in the Department of Physiology, valuable assistance and advice was received from the Department of Biochemistry; the Connaught Laboratories provided facilities for the experimental work on extraction; clinical investigation was undertaken by the Department of Medicine; not the least amongst those who co-operated was the Professor of Pharmacology.

Medical colleges of Canada are all engaged in research. Much of this research seeks to throw light upon fundamental problems and because of its very nature may not appear to have immediate practical importance, but it is always valuable. An example of this is the research on the different types of diphtheria bacilli by the late Dr. Westbrook, who was at one time President of the University of British Columbia. His classical description of types are the standard for bacteriological laboratories throughout the world. The numerous workers on the morphology of red blood cells, and the chemical workers on the estimation of salts in small quantities of the blood, could not see any practical application of their researches, yet the knowledge that they acquired now forms the groundwork for the clinical investigation on pernicious anæmia in progress at Winnipeg under the auspices of the Gordon Bell Memorial.

When a Canadian visits the medical centres of the United States he is astounded at the money and facilities at the disposal of the workers. When we contrast the facilities offered in our own centres we cannot blame the ambitious Canadian who sacrifices nationality for opportunity. The last number of the *University of Toronto Monthly* showed that 87 per cent of the graduates in medicine last year entered hospitals and of these 43 per cent went

to the United States. When we contemplate on the attainments achieved by Canadians living in the United States, we realize what we have lost and are losing through lack of suitable provision for the graduates of our universities.

In the endeavour to overcome this national problem a group of business and university men, headed by Sir William Mulock, have collected over half a million dollars, the interest of which is to be devoted to support workers under the Research Foundation. This Foundation seeks to assist those who cannot readily obtain assistance from other sources. It is not confined to workers in the University of Toronto

but is open to students in other universities. Its aim is to promote the carrying out of medical research by the men who have the ideas, by providing them with the necessary facilities.

In conclusion, may I urge the Canadian physicians from ocean to ocean to join in a united effort which has as its aim the prevention and alleviation of human suffering, the maintenance of health and the prolongation of human life. May the medical profession itself show its health and vitality by the production of new facts which will be freely given to the world at large.

An Address

ON

ADDISON'S (PERNICIOUS) ANÆMIA*

BY DUNCAN GRAHAM, M.B.

Professor of Medicine, University of Toronto

PERNICIOUS anæmia, the subject selected by your Council for my address, is one of great interest and importance both to the profession and to the public. Within recent years the public generally has become familiar with the serious nature of this form of anæmia, and many patients when told by their physicians they are suffering from anæmia anxiously enquire, "Is it pernicious anæmia?" The general practitioner is familiar with the discouraging results obtained from the many forms of treatment suggested for the disease, and the clinical investigator with its baffling nature. Although the outlook may be discouraging to patient and physician alike it is not without hope. Much can be done by early diagnosis and careful treatment to prolong the lives of those suffering from the disease. In my address to you to-day, it is impossible to refer to all phases of the problem, and I shall confine my remarks chiefly to some points in the early diagnosis and treatment of this disease.

For years different writers have commented upon the unfortunate name, "progressive pernicious anæmia", given by Biermer in 1871 to the disease so ably described by Addison in 1855 as "idiopathic anæmia". Until we know something more definite as to the ætiology of the disease it is preferable to follow the suggestion of William Hunter and refer to it as "Addison's anæmia".

Certain signs and symptoms, as pallor, lassitude, weakness, shortness of breath, are common to all types of anæmia and vary in severity with the degree of anæmia present. In Addison's anæmia one finds additional signs and symptoms suggesting disease in parts of the body other than the blood-forming organs, more particularly the digestive system and the nervous system. These often constitute the chief complaints of patients suffering from this type of anæmia, and often develop long before any of the signs or symptoms of anæmia. The failure to recognize these complaints referable to the digestive and nervous systems as early signs of Addison's anæmia is chiefly responsible for the making

* Read at the Annual Meeting, Canadian Medical Association, Victoria, June, 1926.

of a wrong diagnosis and the failure to make an early diagnosis in patients suffering from this disease.

Among disturbances of the digestive system, periodic sore tongue is one of the earliest diagnostic signs of Addison's anæmia and occurs in over 75 per cent of the cases. Although the presence of sore tongue in cases of anæmia was first described by Möller in 1851, it was William Hunter who, in 1890, called particular attention to it as an early and important diagnostic feature in the diagnosis of Addison's anæmia. The patient complains of a burning pain about the tip and edges of the tongue, when eating acid, salty or hot food; the pain is usually present for a few days or a week, then disappears to return again in a few weeks or months. The sore areas are fiery red in colour, or the whole tongue may appear raw; superficial ulcers or small vesicles may be found. As the anæmia progresses the soreness of the tongue decreases and at the time of the first examination one usually finds the typical clean, smooth, pale, flabby, atrophic tongue so characteristic of the later stages of the disease. Histological examination of the tongue shows the presence of a definite glossitis. The important points to remember are: that the soreness of the tongue occurs early in the disease before an anæmia of any degree has developed; that it is followed by atrophy of the tongue; that it occurs periodically and tends to decrease as the anæmia increases in severity.

Another constant or almost constant finding, and one that precedes the development of the anæmia, and persists throughout the course of the disease is the absence of free hydrochloric acid from the stomach contents. Cameron of Winnipeg has shown recently that the chloride ion is absent in most cases. A decrease or absence of the digestive juices secreted by the stomach is usually associated with the achlorhydria. Common gastro-intestinal disturbances which, like soreness of the tongue, may be present before signs of anæmia develop are epigastric discomfort or fullness, loss of appetite, less often nausea and vomiting, flatulence, diarrhoea, constipation, or alternating diarrhoea and constipation. An exacerbation of the gastric symptoms, nausea, vomiting and complete anorexia, often associated with a stuporous condition, is common. It may occur suddenly, to

disappear as suddenly, or it may persist for some days or weeks. Why these exacerbations of gastric symptoms occur is unknown. They present one of the most difficult problems in treatment.

Histological examination of the spinal cord in fatal cases of Addison's anæmia show that about 80 per cent have degenerative lesions of a patchy character, chiefly affecting the posterior and lateral columns. It is, therefore, not surprising to find in cases of Addison's anæmia signs and symptoms of disease of the nervous system. That the cord lesions are not the result of the anæmia may be considered as definitely proven for it is not uncommon to see cases with marked involvement of the cord having a red blood count of over 3,000,000, with a hæmoglobin of over 70 per cent. Numbness and tingling in the hands and feet are the common early complaints. In patients whose occupations demand fine work with the fingers the first indication of anything wrong may be an inability to do their work properly. Patients may come complaining first of difficulty in walking, girdle or lightning pains, or of difficulty in passing urine. Examination may show an ataxic gait, absent knee and ankle jerks, hypotonicity, disturbance of sense of position and of vibration sense, and loss of sphincter control, indicating a lesion of the posterior column of the cord as in tabes dorsalis; in others a spastic gait, increased reflexes, hypertonicity, and a positive Babinski, indicating that a lesion of the lateral column of the cord, may be present. More often a combined lesion of the posterior and lateral columns is found with signs and symptoms of the former predominating. Some of these cases die before a definite anæmia has developed; in some the nervous involvement and the symptoms of anæmia develop together, one or the other predominating. A remission of even severe nervous symptoms may occur but they are more often progressive, the patient dying with a flaccid paralysis. It is evident that the same cause is responsible for the anæmia and the lesions in the nervous system.

As combined degeneration may occasionally arise from other causes an examination should be made in all cases of the stomach contents after a fractional test meal for the possible absence of free hydrochloric acid and of the

blood for the early hæmatological signs of this disease. It is, therefore, important to consider Addison's anæmia as a possible diagnosis in all cases exhibiting nervous symptoms pointing to a lesion in the posterior column of the cord, suggesting *tabes dorsalis* or *taboparesis*. Despite the absence of an Argyll Robertson pupil and a negative Wassermann reaction in the blood and spinal fluid, this type of case is sometimes diagnosed *tabes dorsalis* and given antisyphilitic treatment. Mental disturbances, sometimes quite severe, are not uncommon but occur much less often than nervous symptoms due to spinal lesions.

When the disease affects the blood-forming organs, particularly the red bone marrow and the spleen, symptoms characteristic of all forms of anæmia, depending upon the severity and the rapidity of its development, appear together with certain signs more or less characteristic of the Addisonian type of anæmia. Probably the most common complaint of patients is general weakness and lassitude of slow and insidious onset. After a few months an exacerbation usually occurs, and the patient or his friends notice that he is pale and his skin has a lemon tint. Other symptoms, such as shortness of breath and palpitation, may be present, or the patient may notice that his feet tend to swell toward the end of the day. Fever is seldom absent at this stage. It is usually of a low grade and intermittent in character; less often a high fever is present. Fever tends to persist throughout a relapse and may last for months. The lemon tint of the skin is due, as in jaundice, to the deposition of bilirubin. Examination of the urine shows an increased urobilin output and the blood plasma shows a bilirubinæmia. These are signs of increased blood destruction and, like the fever, are present during relapses and disappear during definite remissions.

Despite the characteristic appearance and clinical history of patients suffering from Addison's anæmia, examination of the blood is essential for a positive diagnosis. The bleeding time is prolonged and the clotting time about normal. The plasma volume of the blood is increased, and the total volume of the blood decreased or normal. At the time of the first examination the red blood count is usually below 2,000,000, and in definite relapses below

1,000,000. The hæmoglobin does not show a corresponding decrease, thereby giving a colour index of above one. In practically all other forms of anæmia the colour index is one or less. The white blood cells are decreased often below 4,000. One of the most important diagnostic findings is a diminution in the number of the platelets, which probably explains the constant absence of thrombosis in cases of Addison's anæmia.

The examination of the blood smear is particularly important in early diagnosis, more especially in cases showing definite symptoms referable to the nervous system, with slight or no signs of anæmia. The red cells show a uniformly good hæmoglobin content, whether small or large red cells are present. During a relapse anisocytosis is marked; large and small cells—macrocytes and microcytes—are present. As the patient improves the microcytes decrease and may completely disappear leaving the larger cells with a uniformly good hæmoglobin content, and the diminution in the number of platelets as the only hæmatological signs diagnostic of Addison's anæmia. At one time it was considered almost necessary to find megaloblasts before making a diagnosis of this form of anæmia; they are very often absent and are not essential for a positive diagnosis. If nucleated reds are present in the smear, megaloblasts are always found in greater numbers than normoblasts; this is an important point in the differential diagnosis from other forms of anæmia showing nucleated reds. They are most commonly found at the beginning of a remission or shortly before death. The white blood cells are diminished in number and the relative percentage of polymorphonuclears is normal or decreased. This finding may be of great value in the differential diagnosis of Addison's anæmia from other severe types of anæmia which develop secondary to carcinoma of the stomach or carcinoma of the bone marrow, for in the latter conditions the white blood count and the percentage of polymorphonuclears is normal or increased. Macrocytosis, uniformly good hæmoglobin content of the red blood cells, and a diminution in the number of platelets are the important early hæmatological findings diagnostic of Addison's anæmia.

In the majority of cases during a relapse

the red blood count shows little change except in the acute stage, despite the increased blood destruction. This is proof that the bone marrow is producing as great or greater number of red blood cells than normally. Examination of blood smears at this stage shows polychromasia, and an increased number of red cells showing reticular staining, signs of regeneration in the bone marrow. In a certain percentage of cases, usually in the terminal stage, the bone marrow no longer responds to the increased demand for new red blood cells. As a result the red and white blood cells and the platelets diminish in number. Urobilin is absent from the urine; no bilirubinemia is present; the signs of increased blood destruction are absent. Examination of the blood smear fails to show the presence of red cells showing polychromasia, basophilic granulation or reticular staining. The signs of regeneration of the bone marrow are absent. This is often referred to as the regenerative form or stage of Addison's anæmia.

A common clinical finding is the presence of focal infection, particularly of the teeth and gums. Some consider focal infection the cause of the anæmia, others that the infection is secondary to the anæmia, the latter predisposing to its development. Whether it be the cause or the result of the anæmia, foci of infection should be carefully searched for and removed at an appropriate time during treatment.

There are a few general facts that may be recalled with reference to the disease. The majority of cases occur between forty and sixty years of age. It is uncommon before thirty and after seventy years of age. It is about equally common in men and women; among the rich and the poor, it affects all classes. It is much less common among the coloured than among the white population in the United States, and is reported as being uncommon in the tropics. It is not only more common in some countries than in others, but is also more common in certain parts of the same country. An investigation into the local geographical distribution of the disease has recently been reported by Montgomery of Winnipeg. One of the characteristics of the disease is the presence in the vast majority of cases of relapses and remissions. This is most important in the consideration of the efficacy

of any specific form of therapy. Occasionally the onset of the disease is sudden but is usually slow and insidious. After a few months a relapse occurs, and may last for a few weeks or months to be followed in a few months to a year by another relapse. A second relapse may occur years after the first, the patient feeling well in the interim. This relapse is usually fatal. In some cases definite relapses and definite remissions occur. In others the relapses are less marked and the patient does not recover as completely during the remission, the disease being slowly progressive. All variations between these two types of cases may occur. The majority of patients die within two years from the onset, the clinical history indicating that they have suffered from two or, less often, three relapses. Occasionally the patient dies in the first acute attack. In a few cases the course is more chronic, the relapses more mild and the patient may have six or more relapses before death.

Before discussing treatment it may be of interest to mention briefly some facts with reference to the cause of the disease. In certain countries, notably Finland where the people eat raw or uncooked fish, many of the inhabitants harbour in the intestine the broad tape worm, *dibothriocephalus latus*. Although no symptoms are produced by the worm in the majority of the people, a certain proportion show a slight anæmia and a few develop an anæmia having all the clinical and hæmatological characteristics of the Addisonian type. After the removal of the worm from the intestine the patient makes a complete and lasting recovery provided the disease has not advanced too far before the treatment is begun. During pregnancy an anæmia, often of a very severe type, is not uncommon. In a few cases this is of the Addisonian type, the patient making a complete recovery following upon the termination of the pregnancy. Occasionally syphilitic infection may be the cause of the disease. From these observations which have been carefully controlled one may conclude: (1) that in a few cases of Addison's anæmia the cause is known; (2) that there is no single cause for the disease. The fact that in the instances mentioned above the patients completely recovered after the removal of the cause lends strong support to the idea that the

disease is caused by a toxin acting on the bone marrow, nervous system and digestive system.

As all pregnant patients or people harbouring the broad tape worm do not develop Addison's anæmia it would appear that the toxin causing the disease demands certain conditions within the body for its development or an inherited or acquired susceptibility of the bone marrow, nervous system and digestive system. The history of Addison's anæmia in more than one member of a family occurs sufficiently often to suggest an inherited disposition as a possible factor. The almost constant presence of achlorhydria in cases of Addison's anæmia and its frequent occurrence in other members of the family not suffering from the disease suggest that achlorhydria may be one of the inherited factors which may serve as a predisposing cause. As achlorhydria is absent in about half the cases of Addison's anæmia due to the broad tape worm it cannot be the sole predisposing cause.

The abnormal blood formation characteristic of the Addisonian type of anæmia is not simply the result of increased blood destruction, for in other types of anæmia in which increased blood destruction is present, and often much more severe, the response of the bone marrow is quite different. It is true that in acquired hæmolytic jaundice an anæmia associated with increased blood destruction is present, and that the disease is characterized by fever and relapses as in Addison's anæmia, but remissions are not so complete, focal degeneration of the spinal cord and glossitis are absent, and the response of the bone marrow more closely resembles that found in types of anæmia due to increased blood destruction. It would appear that in individuals susceptible to the toxin causing Addison's anæmia a deficiency of the bone marrow, inherited or acquired is present.

An abnormal activity of the reticulo-endothelial system of the bone marrow, spleen and liver causing increased destruction of the red blood cells by phagocytosis may be a factor in the production of the disease.

In the vast majority of cases in which the cause of the disease is unknown it is probable that the toxin is absorbed from the intestine. Some believe that the absence of free hydrochloric acid from the gastric secretion allows bacteria swallowed in the food to enter the small intestine. As a result a toxin derived

from the bacteria themselves or from the bacterial decomposition of protein in the intestine is formed which upon absorption causes the disease.

It must be evident from this very brief and necessarily incomplete review of our knowledge as to the cause of Addison's anæmia that the problem is a very complicated one, and that much more information is required before we will have a truer conception of the disease and the processes at work in the body in its development. The fact that a cause of the disease has been found in a few cases and that a complete recovery has followed its removal should encourage further investigation in the hope that a successful solution of the problem may be discovered.

Treatment.—In the beginning of treatment the patient should have absolute rest in bed and be free from all responsibilities. Rest treatment should be continued until fever has disappeared and the red blood count is over 3,000,000 and the hæmoglobin over 60 per cent. The patient may then be allowed to sit up and move about, all exercise to be well within the point of fatigue. In cases with signs of cord degeneration appropriate exercise should be recommended as soon as the patient is able to be about. The value of rest in bed cannot be over emphasized.

One of the most difficult problems in the beginning of treatment is to get the patient to eat, and later to take an adequate amount of food. In those cases suffering from an exacerbation of gastro-intestinal symptoms, mainly nausea, vomiting and complete anorexia, it is especially difficult to get the patient to take any food. Ordinary milk or one of the sour milk preparations, given in small quantities and at frequent intervals, is the most satisfactory method of beginning treatment. The quantity of milk should be gradually increased from one to two litres daily. Then slowly increase the diet by the addition of junket, custards, cream and vegetable soups, gruels, fruit juices, etc., until the patient is able to take some solid food in the form of small quantities of scraped beef lightly cooked. As pointed out by Whipple and his associates the most valuable foods in the treatment of anæmia are iron-rich foods. Among these are liver, blood sausage, spleen, lightly cooked red meats, sweatbreads, egg yolk and spinach. Minot

has recently reported favourable results from the feeding of liver. The diet should contain, in addition to an adequate amount of protein, a liberal amount of starches and sugars, fresh fruits and green vegetables. The patient should be encouraged to drink ordinary milk or a sour milk preparation at the end of the meal and between meals. Experience in the treatment of diabetic patients has shown that a great deal can be done by daily talks in getting patients to eat various articles of diet and encouraging them to try certain foods they say they cannot eat.

On account of the achlorhydria the patient should be given hydrochloric acid in doses of one drachm to a drachm and a half three times a day. The acid is given in a tumblerful of lemonade sweetened with sugar, and the patient is instructed to take one-third half an hour before each meal, one-third during the meal, and one-third half an hour after the meal. In some patients it is better to begin with the smaller dose and gradually increase it. The acid has a beneficial effect on the diarrhoea so common in cases of achlorhydria. In the dose suggested, it restores the antiseptic properties of the gastric juice by maintaining the acidity at about a normal level. The patient should continue the treatment indefinitely.

Arsenic is the only drug that may have some direct beneficial action in stimulating blood production in Addison's anæmia. It may be given in the form of Fowler's solution, beginning with 3 minims three times a day after meals, and increasing 1 minim a dose until the patient is taking 15 minims per dose. The treatment should be discontinued for a week or so and then resumed, giving the patient 7 minims three times a day for several months. If arsenic given by mouth tends to cause gastric disturbances it may be given by intramuscular injections in the form of sodium cacodylate in $\frac{1}{2}$ grain doses once a day for a week, repeating the course at intervals. One must keep the patient taking arsenic under observation, discontinuing the drug if any signs of arsenical poisoning develop.

Blood transfusion is often of distinct value in treatment. It is not to be included as a routine method of treatment for all cases. A

transfusion of 250 c.c. of whole blood should be given: (1) if the blood count is below 1,000,000; (2) if after a few weeks of treatment as already outlined, the red blood count is not improving or is diminishing; (3) in cases with severe gastro-intestinal disturbances that have continued for several days despite other treatment. If any signs of improvement follow the first transfusion a second should be given at the end of a week to ten days, followed by a third in two weeks.

Splenectomy may be tried in young patients with marked signs of blood destruction, and with definite enlargement of the spleen, when the method of treatment outlined above has failed to produce results.

As soon as rest and dietetic treatment have been established the teeth and gums should be carefully examined; infected teeth removed and the gums treated. Later, foci of infection in tonsils, sinuses, etc., should receive appropriate treatment for the removal of the infection. Foci of infection should be sought for, and treated early in every case. A careful search should be made of the faeces for ova and parasites, and if found appropriate treatment should be given. After the patient has recovered from his relapse, and is able to be up and about, he should continue the dietetic and medical treatment prescribed. He should avoid fatigue, physical and mental. If there is any return of symptoms, the patient should report to his physician and, depending on the severity of the symptoms, a further period of absolute rest or controlled rest and exercise should be prescribed.

Unless the cause of the disease is found and can be removed or effectively treated no method of treatment will lead to a permanent cure. Our object in treatment should be to remove or treat all conditions that ordinarily produce anæmia, such as: infections, parasites, hæmorrhage, etc.; to replace deficiencies, such as hydrochloric acid; and to apply a method of treatment that will shorten relapses, and make remissions more complete, thereby allowing the patient to lead a more enjoyable, useful and possibly longer life. It is felt that the plan of treatment outlined above is the one most likely to attain this object.

ENCEPHALITIS LETHARGICA*

BY CHAS. HUNTER, M.A., M.D., (ABER.), M.R.C.P., (LOND.)

Winnipeg

I HAVE thought it advisable to take up encephalitis lethargica from the standpoint of the general practitioner, who inevitably encounters this strange disease and naturally desires some practical help in dealing with the problems presented by it.

It is still—and may well remain—in dispute whether outbreaks of encephalitis lethargica occurred prior to 1917; certainly we find accounts of isolated cases and even of epidemics (notably in 1889-90) highly suggestive of this possibility. In the nine years since its appearance, no part of the globe has escaped its ravages; the disease in Europe and North America appears mainly in the colder months, while poliomyelitis occurs in the late summer and early autumn; cities have been affected more than country districts; in Winnipeg, as in Warsaw, the Jewish race has suffered more than the rest of the community. Most statistics show that the sexes are equally vulnerable but a few show a considerably higher incidence in the male sex; suckling infants and old people do not escape, though most of the cases occur between the ages of twenty and fifty. Of 864 cases reported by the American Association for Research in Nervous and Mental Diseases, seventeen were physicians, but English, French and German statistics do not show any connection between occupation and liability to infection.

Infectivity.—MacNalty of the English Ministry of Health has recently said: "The conclusion seems to be justified that encephalitis lethargica is infective like cerebrospinal fever and poliomyelitis and is liable to manifestation in epidemic form." It is true that in all countries, cases of direct case contagion are found to be exceedingly uncommon, yet small outbreaks of encephalitis have been noted in institutions; exceptionally, two cases are found in one family, and instances are recorded of mothers suffering from encephalitis, infecting the child

shortly after birth. In the transmission of infection, mild and ambulant cases of encephalitis are in all probability active and as established in poliomyelitis, healthy persons who have been in close contact with the sick, probably carry the disease. It seems likely that the virus of encephalitis lethargica first infects the upper respiratory passages, whence it spreads to the brain, or without producing symptoms in the carrier, conveys the disease to others. MacNalty thinks the virus may also gain access to the brain through the eyes, as suggested by the occasional presence of conjunctivitis. There is no proof that encephalitis lethargica occurs in the lower animals.

The incubation period has not been definitely established—varying apparently from one or two days to a fortnight or more.

The exact relationship of influenza to encephalitis lethargica is not known, and as long as the infecting organism is not definitely isolated in either disease, is likely to remain a matter for conjecture. From influenza, in any case, encephalitis differs so greatly in its very slight power of infection, in its clinical course, and especially in its sequelæ and pathological findings that it is evidently a distinct disease and not merely a cerebral form of influenza.

Epidemic hiccup on the other hand is more closely allied to encephalitis; hiccup occurs occasionally in actual cases of encephalitis lethargica, or may usher in that disease; it may occur in epidemic form when encephalitis is rife, and was not known so to occur previously; on the other hand, it is evidently much more infective than encephalitis, does not end fatally, and so far as I know, is not followed by any disastrous sequelæ. According to Cadham, at least one thousand cases of hiccup occurred in Winnipeg during November and December, 1919, during which winter 104 cases of encephalitis occurred; curiously enough, no hiccup was recorded in the second (1922-23) epidemic of 108 cases of encephalitis, though in

* Delivered before the Canadian Medical Association at Victoria, June 23, 1926.

it many more cases of myoclonic spasm occurred than in the first epidemic. Some 1,400 cases of hiccup occurred during six weeks in November, 1924, when encephalitis was not epidemic; the average duration was 3 days, and more than 90 per cent of the cases occurred in males. Rosenow claims to have isolated from the nasopharynx of patients suffering from epidemic hiccup, a streptococcus with which spasms of the diaphragm can be produced experimentally in animals.

Transmission of encephalitis lethargica to animals.—Much experimentation has been done, and it was claimed by Loewe and Strauss, as well as by Levaditi and others, that encephalitis lethargica could be produced in rabbits by inoculation of material from the nasopharynx or from the brain of a person dead of the disease. More recently however, two sources of error were found in these experiments: (1) spontaneous (so-called) encephalitis occurs frequently in rabbits, as shown by McCartney, and had been mistaken for transmitted encephalitis lethargica. (2) Simple herpes, the virus of which apparently is not uncommonly present in man, may be readily transmitted to rabbits and produces in them a fatal encephalitis. Hence da Fano in *Medical Science* of August, 1924, and W. G. MacCallum in *Medicine* of February, 1926, conclude that we are entirely ignorant of the nature of the causative agent in encephalitis lethargica, and that the unequivocal transmission of the disease to animals has not yet been achieved.

Pathology.—The naked-eye appearances of the brain in encephalitis are not striking; congestion of the meninges, occasionally meningeal or sub-arachnoid hæmorrhages, and congestion or minute hæmorrhages involving mainly the gray matter of the basal ganglia around the aqueduct of Sylvius and the floor of the fourth ventricle. Microscopically, the main lesions are found to be (1) Small celled infiltration by lymphocytes and plasma cells of the perivascular lymphatic sheaths, especially of the small veins, in the same area of the brain. This inflammatory perivascular infiltration is especially characteristic of encephalitis lethargica and may be found even in cases of some years' standing, associated with pathological changes obviously of older date. (2) Patchy infiltration by neuroglia cells of the nuclei of the cranial nerves and basal

ganglia with degeneration of some of the associated nerve cells. Thus in old cases dying with paralysis agitans symptoms (the Parkinsonian syndrome) we find marked loss of cells in the substantia nigra and corpus striatum with proliferation of the neuroglia, associated with the above perivascular infiltration. Such a microscopic picture from a case of some years' standing suggests the presence of an active progressive process and no mere residuum of a pathological condition long inactive—a fact which will be referred to later in considering the course and prognosis of the disease.

It should be further noted that the lesions involve mainly the gray matter and are not confined to the brain stem, but may be found scattered widely to involve the cortex of the brain, the cerebellum and the spinal cord, though usually these parts escape lightly. The paralyses of the cranial nerves, (notably those to the eye and facial muscles) are readily explained by the scattered lesions found involving the nuclei of these nerves; the increased muscular tone, so constantly met with in the Parkinsonian syndrome, as well as the less frequent tremor are due to involvement of the corpus striatum. For, as has been so luminously shown by Kinnier Wilson, the corpus striatum is a body, one of whose functions is tone-control, and when the corpus striatum is diseased, tone over-develops in the skeletal muscles generally; tremor too is a release phenomenon of lower mechanisms, seen when the normal inhibitive function of the corpus striatum is removed by disease. The lethargy so frequently seen in encephalitis cannot be satisfactorily explained, I think, at present.

As might be expected in a disease which involves mainly the deeper structures of the brain, the *cerebrospinal fluid* is not characteristically altered; the pressure is usually slightly increased; the protein is little if at all increased; while in the early weeks of the disease, there is almost always some increase in lymphocytes which rarely exceeds 100 per c.mm. and in one-third to one-half of the cases, falls below 10 per c.mm.; the sugar content of the cerebrospinal fluid is usually rather above normal, a valuable point in differentiation from tubercular meningitis where the cerebrospinal sugar is diminished; the Wassermann is negative, but the colloidal gold test may give a luetie curve: (Greenfield

and Carmichael). Even in chronic encephalitis lethargica, Wimmer found a slight lymphocytosis in 55 per cent of his cases, usually with no increase in globulin, and with normal sugar value.

Symptomatology.—The onset in perhaps 75 per cent of the cases is gradual with headache, weakness, drowsiness or restlessness; catarrhal symptoms, as in influenza, are not common. In possibly 25 per cent, the disease begins acutely, sometimes with severe headache, vomiting, fever and delirium; sometimes with violent pains in the face, neck or other parts of the body; choreic, or other involuntary muscular movements may be the first symptom, and above all, *double vision*.

It must be emphasized that both in the mode of onset, and in the symptomatology of the established disease, the most perplexing variations appear. Walshe has pointed out that the virus of encephalitis may have an irritative action on any part of the nervous system; producing on the cortex, convulsions or extreme choreiform restlessness, or acting on the nerve roots, intense neuralgic pains and myoclonic contractions, but that the *paralytic* action of the virus is restricted to certain groups of motor neurons in the basal ganglia and brain stem, producing paralyses of cranial nerves, the Parkinsonian syndrome and lethargy. In most cases, both paralytic and irritative symptoms are present, although in the early cases seen, the paralytic features were more pronounced, while the victims in the last two or three years have shown more irritative phenomena.

Fever.—There is no characteristic temperature curve; some cases are apparently afebrile throughout; the great majority run some temperature usually from 100° to 102°, though many reach 103° or over; the fever lasts a varying period, perhaps on an average from a few days to one to two weeks, and has little influence on the prognosis. Wimmer points out that even in chronic encephalitis febrile phases may occur sometimes lasting for days or weeks at a time.

The pulse in the early stage is usually increased—possibly over 100, even in the absence of temperature, and as Hall points out, often remains so even in the Parkinsonian state. There is in most cases polynuclear leucocytosis, perhaps of 12,000 or over, Straus even giving 25,000 to 30,000 as a common figure in the early stage.

Lethargy was so marked a symptom in the early cases that it dominated the picture, and even in the later series, was present in some degree, probably in half the cases. The common drowsiness of the onset gives gradually place to a profound sleepiness, which may however overtake the subject more suddenly at table or in the office or even on the street. Lying quietly with the eyes closed and with muscles relaxed, oblivious to his surroundings, the patient can still be roused like a man drunk with sleep, will answer quite intelligently, but immediately sinks again into deep slumber. Such a condition may last for days, occasionally for weeks, and exceptionally for two or three months; in grave cases, the lethargy deepens into stupor or even coma, with involuntary passage of urine and feces. In some cases the patient simply loses interest in things, is apathetic, and sits about without being definitely lethargic. In the more recent epidemics, restlessness and sleeplessness, often with active delirium, have occurred very frequently; this insomnia may later give place to lethargy.

Lesions of cranial nerves.—When encephalitis lethargica first appeared *ocular* paralyses of various types occurred according to Parsons in about 75 per cent, according to Straus in 80 to 85 per cent, and even in the later irritative types, ocular paralyses are seen in the majority of cases. Double vision is an extremely common, but often fleeting complaint, associated with weakness of the third or sixth nerve; nystagmus is frequent and sometimes persistent; ptosis often occurs, increasing the sleepy appearance so often present; paralysis of accommodation is frequent, with consequent blurring of vision and is apt to be more persistent than the double vision; the pupils are sometimes unequal and may fail to react to light—a finding the more to be emphasized as hitherto associated with lues; optic neuritis is quite uncommon, but is occasionally found and may exceptionally be followed by optic atrophy. Weakness of the *facial* muscles is extremely common, usually unilateral or at least unequal on the two sides; other cranial nerves may be exceptionally involved.

Involuntary movements are very common and very characteristic of encephalitis. Associated with excitement and delirium, choreic movements may occur, evidently from irritation of the motor cortex; also quite early in the disease, lightning,

rhythmical jerkings, recurring twenty to seventy or more times a minute may appear in some muscle or group of muscles, *e.g.*, around the shoulders or in the abdominal wall—in the latter position, when the myoclonic spasms are associated with severe muscular cramps, an acute abdomen has been diagnosed repeatedly. Myoclonic contractions are particularly valuable in the diagnosis of encephalitis, lasting as they do, for days or even for weeks. Hiccup, of course, belongs to this myoclonic group. Rhythmical tremor, of the paralysis agitans type but less constant and conspicuous, and sometimes in the face, may occur, but even in marked Parkinsonian cases, is usually absent.

Increase of muscular tone may appear within the first few days and was often seen when encephalitis first appeared, in association with lethargy; this early rigidity may pass off entirely, the patient having no symptoms for years at least, though much more frequently, the condition is permanent. Usually however, without early rigidity and many months or even years after the attack of encephalitis, increase of muscular tone appears and develops into the *Parkinsonian syndrome*, which is exceedingly common. Hall finds that this syndrome develops on an average of six to twelve months after the attack of encephalitis, and that in this interval, most patients suffer from sleeplessness, lack of power of concentration or a sense of exhaustion; Gordon Holmes reports a case developing four and one-half years after encephalitis, and even longer intervals are on record. Further, the original attack may be very mild—in fact, occasionally no definite history may be obtainable, though the rapid development of the Parkinsonian syndrome in a young person makes a preceding encephalitis practically a certainty. Every general practitioner is certain to meet with these cases, whose general appearance recalls at once the familiar appearance of paralysis agitans. The general increase of muscular tone leads to the fixed expression of face, the infrequent winking, the bowed head, the semi-flexed elbows, without the usual swing of the arms in walking, together with general slowing and stiffness in movement. As distinguished from true paralysis agitans, the Parkinsonian syndrome of encephalitis lethargica often occurs in young people; tremor is relatively rare; changes in the pupils, as already referred to, may be present,

or possibly, an extensor response on stroking the sole, while the rapid onset and advance of the Parkinsonian syndrome contrasts with the much more leisurely advance of paralysis agitans. In both diseases however, it should be remembered that for a few seconds, voluntary effort may replace the shuffling gait and tardy grasp by unexpected briskness of movement.

Pains.—Severe, even excruciating pains, sometimes neuritic, sometimes apparently of central origin, are frequent at the onset, occurring in the face, in the back of the neck, on the shoulder, along the ulnar side of the forearm, or over the lower abdomen. Accompanied sometimes by hyperæsthesia, these pains may be most perplexing, and may mislead the physician into an erroneous diagnosis of meningitis, pleurisy or appendicitis. In times of epidemic, intractable pains of unusual character, often accompanied by fever, should make the physician think of encephalitis, a suspicion which may be confirmed in a few days by the onset of myoclonic contractions in the affected part.

Boyd has drawn attention to the curious hyperæsthesias occurring during an epidemic of encephalitis, *e.g.*, marked tenderness of the scalp in brushing the hair, sunburnt feeling in the face, and undue sensitiveness of the skin in patches on the arms or chest. These hyperæsthetic areas have been found quite frequently, as Boyd points out, in typical cases of encephalitis, in atypical cases, and often in people otherwise well and remaining so, throughout the epidemic.

Respiratory disorders.—Though lobar and broncho-pneumonias are conspicuously absent in encephalitis, respiratory disorders are fairly common; rapid breathing up to sixty or eighty a minute, continuously or in attacks may occur without cyanosis or distress, and may continue indefinitely, while curious breath-holding spells, yawning and spasmodic cough are less frequent sequelæ.

Abortive cases are probably quite common; whether epidemic hiccup and epidemic hyperæsthesias represent very mild invasions of the encephalitic virus may be disputed; frequently however, a passing malaise with double vision or a so-called influenza with pathological sleepiness precedes by some months a definite Parkinsonian syndrome. For, as time goes on, the accumulating evidence goes to show that in enceph-

alitis lethargica we have no acute disease like poliomyelitis rapidly running its course, and leaving sequelæ in its train; rather the virus, as in syphilis, may remain active for years within the nervous system, causing by recurring flare-up or slow inflammatory lesion, increasing disability to the patient. This conclusion has been forced on observers by the progressive nature of the symptoms in many cases, by their recurrence after a latency of months or years in others, and by the discovery post mortem of recent inflammatory and older scar-like lesions in the same case.

Later manifestations.—The most common of the *later manifestations* is the Parkinsonian syndrome already described, but myoclonic and other involuntary movements are not infrequent; persistent headache, a sense of fatigue, mental and physical, and sleeplessness may be complained of for many months; diabetes insipidus and obesity are occasionally met with. Most distressing of all is the not infrequent mental and moral deterioration, which may follow encephalitis lethargica in children. Bright, well-balanced children become irritable, unable to concentrate, restless and often sleepless; they may unfortunately also become mischievous, dishonest, precocious sexually, and criminal, so that in their early teens they have to appear in the juvenile court.

Diagnosis.—I have not emphasized sufficiently how extremely varied and complex the nervous symptomatology may be; indeed, nowadays, in the presence of almost any obscure nervous syndrome (acute or chronic) encephalitis lethargica must be taken into consideration. It is impossible to consider the diagnosis in detail, but I would stress the value of a careful history, and also certain symptoms and physical signs which are highly suggestive of encephalitis. Thus an illness with pathological drowsiness, combined or not with double vision, should make the physician think of encephalitis, and such history may be obtained only by cross-questioning; even double vision alone with some malaise is suspicious (if lues can be excluded) and so are pupillary disturbances, both to light and accommodation. The ophthalmoscope (too little employed in routine examination) will show, in the great majority of cases, no change in the fundus and thus will help to exclude brain tumour. Myoclonic twitchings of a muscle or

group of associated muscles is almost pathognomonic of encephalitis; tremor and choreiform movements not obviously explicable otherwise, demand consideration; violent and unexplained pains at the beginning of a doubtful illness, in the presence of an epidemic of encephalitis, are highly suspicious.

The Parkinsonian syndrome in a patient under forty is practically always post-encephalitic, and even after the age of forty, if it develops very rapidly or if physical signs not encountered in true paralysis agitans be associated, (such as paralyse of ocular muscles or extensor sole response) encephalitis lethargica is the probable diagnosis.

Influenza as a diagnosis, except in time of epidemic, should be regarded by the serious practitioner merely as a cloak for his ignorance; the history and possibly a suggestion of slowness in movement, of fixity in expression, of lack of the usual swing of the arm in walking, may save the patient from the facile diagnosis of hysteria or neurasthenia.

Prognosis.—(1) The *immediate mortality* is variously assessed; Straus in Kraus & Brugsch's System, estimates it at between 30 and 40 per cent for the notified cases, but is inclined to think that the inclusion of slighter unnotified cases would bring the figure down to 15 to 20 per cent; Goldstein in the recently published Handbook of Mohr & Staehelin, gives it as varying from 20 to 59 per cent; May in the French *New System of Medicine*, gives 30 to 35 per cent; for 1273 cases, notified in England and Wales, the mortality was 48 per cent, but the English Ministry of Health points out that the mild non-fatal cases are apt not to be notified; Hall estimates the immediate mortality as 27 per cent—on the whole, the estimate of the American Association for Research in Nervous and Mental Disease, at 10 to 20 per cent may not be far off the mark. Of 135 fatal cases collected by Hall, one-third died in the second week, and 83 per cent within the first month; the earliest death was on the second day.

(2) Still more difficult is it to estimate the *percentage of complete recoveries*; the American estimate in 1921 that of those who survive the acute stage of the illness, about 10 per cent may develop a progressive disease of the central nervous system would appear now much too rosy; Hall from an examination of figures col-

lected in Britain, the United States, Switzerland and Germany, estimates that in every one hundred cases twenty-five die, twenty-five recover practically completely, while fifty recover with residua, of which, perhaps, twenty-five have some degree of the Parkinsonian syndrome. Economo in 1923 considered that about two-thirds of the cases surviving the acute phase, pass into a chronic stage, while Sicard thinks this change takes place in more than one-half of the cases. The Parkinsonian syndrome occurring early in the disease may completely disappear, but when it develops in the later stages, it remains sometimes stationary for a time at least, more often gradually or rapidly getting worse.

Treatment.—The infecting germ unisolated, mild and abortive cases frequent, healthy carriers probable, demonstrable case-to-case contagion uncommon—all these factors militate against the successful prevention of the occurrence and spread of the disease. It would seem wise to enforce compulsory notification, isolation of cases as far as possible, in their homes or in special hospitals, and disinfection of the mouth and nasopharynx of the patient and his attendants.

In the acute attack, even of mild type, it is probably wise, as Hall and Hinds Howell insist, to keep the patient in bed; my own impression is that we err in not insisting sufficiently on the value of rest in bed in the treatment of many acute cerebral conditions from fractured skull inwards. The appetite in the acute attack with fever is frequently very good; at times ravenous, a point seldom mentioned. The treatment in the acute stage is, I think, purely symptomatic; none of the special therapeutic measures suggested have proved of accepted value.

In the treatment of the Parkinsonian state, hyoscine hydrobromide is often of definite value in relieving to some extent the rigidity, and making the patient more comfortable. I have used it usually by mouth in doses of 1/200 grain, at first twice a day, increasing to three or four times a day, or still more, if dizziness, dryness of mouth, or interference with near vision is not induced. Hurst has recently advised a combin-

ation of hyoscine gr. 1/200, pilocarpine nitrate gr. 1/15, liq; strychnin m.iii, four times a day, claiming in this way to be able to push the dose of hyoscine without ill effect.

Hall has recently written on the marked relief afforded in the Parkinsonian state by tincture of belladonna in 10, 20 or even 30 minim doses given three times a day; his patients felt much more comfortable and were able to use their muscles much more freely. Hall does not suggest that the actual disease is in any way controlled by the drug, which acts merely on the neuro-muscular arc, overstimulated in Parkinsonian patients.

In encephalitis lethargica, psychotherapy is likely to be most successful in the hands of quacks.

REFERENCES

- (1) *The American Association for Research in Nervous & Mental Diseases*, "Acute epidemic encephalitis," New York, 1921. (2) MACNALTY, A. S., *Ministry of Health, Reports on public health and medical subjects*: "Encephalitis lethargica," Lond., 1922. (3) CADHAM, FRED T., "Hiccup: the Winnipeg epidemics," *Jour. Amer. Med. Ass.*, Chicago, 1925, lxxxiv, 580. (4) ROSENOW, EDWARD C., "Further studies on the etiology of epidemic hiccup (singultus) and its relation to encephalitis," *Arch. of Neur. & Psych.*, Chicago, 1926, xv, 712. (5) DA FANO, C., "Spontaneous and experimental encephalitis in rabbits," *Med. Science Abst. & Rev.*, Lond., 1924, x, 355. (6) MACCALLUM, W. G., "Present knowledge of filterable viruses," *Medicine*, Baltimore, 1926, v, 59. (7) BUZZARD, E. F., AND GREENFIELD, J. G., "Lethargic encephalitis; its sequelae and morbid anatomy," *Brain*, Lond., 1919, xlii, 305. (8) WILSON, S. A. K., Croonian lectures on "Disorders of motility and of muscle tone, with special reference to the corpus striatum," *Lancet*, Lond., 1925, ii, i, 53, 169, 215, 268. (9) GREENFIELD, J. G., AND CARMICHAEL, E. A., "The cerebrospinal fluid in clinical diagnosis," Lond., 1925. (10) WIMMER, A., "Chronic epidemic encephalitis," Lond., 1924. (11) WALSH, F. M. R., "On the symptom-complexes of lethargic encephalitis with special reference to involuntary muscular contractions," *Brain*, Lond., xliii, 197. (12) HALL, A. J., "Epidemic encephalitis," Bristol, 1924. (13) HALL, A. J., "Post encephalitic Parkinsonian," *Brit. Med. Jour.*, Lond., 1926, i, 127. (14) STRAUS, E., KRAUS AND BRUGSCH'S, "Spezielle Pathologie und Therapie innerer Krankheiten," Berlin & Wien, 1924, Band x, Teil ii, 661. (15) BOYD, W., "Epidemic encephalitis: second Winnipeg outbreak," *Quart. Jour. Med.*, Oxford, 1925, lxx, 153. (16) TURNER, W. A., AND CRITCHLEY, M., "Respiratory disorders in epidemic encephalitis," *Brain*, Lond., 1925, xlviii, 72. (17) GOLDSTEIN, K., BERGMANN AND STAHELIN'S "Handbuch der inneren Medizin," Berlin, 1925, Band v, 202. (18) MAY, E., *Nouveau Traité de Médecine*, Paris, 1922, Fasc. iv, 30. (19) MACNALTY, A. S., "Epidemic diseases of the central nervous system," *Lancet*, Lond., 1925, i, 594.

POST-OPERATIVE PULMONARY COMPLICATIONS

A STUDY FROM THE SURGICAL AND GYNÆCOLOGICAL RECORDS OF THE TORONTO
GENERAL HOSPITAL, AND FROM THOSE OF THE
DEPARTMENT OF PATHOLOGY IN THE UNIVERSITY OF TORONTO

By NORMAN B. GWYN, M.B.

Toronto

PART II*

FROM both a clinical and statistical standpoint the subjoined analysis may be of value in discussing the pulmonary lesions of the post-operative period.

I. *Autopsy Findings.*

(a) In cases dying with symptoms of large pulmonary emboli.

Case 1.—Hysterectomy: thrombosis or embolism of pulmonary artery; no note on condition of pelvic or abdominal veins.

Case 2.—Repair of cystocele: thrombus of right and left pulmonary artery; thrombus of right hypogastric vein.

Case 3.—Hysterectomy: fibroid of uterus, pulmonary embolus and infarct; thrombosis of femoral veins of the broad ligament.

Case 4.—Removal of varicose veins of the leg: "pulmonary thrombi"; no dissection of other veins.

(b) In cases described as acute pleurisy and showing the late onset of symptoms suggestive of the condition labelled "minor embolus."

None of this type of case came to autopsy. This is not to be taken as indicating that such cases are invariably fortunate; late death from development of abscess followed in one case, and death with the symptoms of a gross embolus occurred in another whose subsiding pleurisy had suggested the diagnosis of minor embolus (case 53845). Fatalities however are distinctly less common in this group of cases.

(c) In cases considered as having been post-operative broncho-pneumonia, bronchitis or pneumonia.

In eight complete autopsies the description of the post mortem findings is regularly stated to

be "lobular pneumonia of right and left lung" with an occasionally added note of abscess or of gangrene†. No lobar fibrinous pneumonia resembling an acute pneumococcus infection was met with in the three years. Two of the autopsy descriptions are very suggestive of massive collapse of various lobes of the lung accompanying the broncho-pneumonia. In one of these (49439) the clinical history of rapidly increasing urgency of respiration with suggestive physical signs, had provoked the employment of the aspirating needle on the right side with a very negative result—one c.c. of clear fluid. At autopsy two days later the existence of lobular pneumonia of both lungs was determined, but of the right upper lobe the note is made "that it is collapsed, purple in colour and of a rubbery consistence." In number 52353 of the series, large areas of collapsed lung were found at autopsy, co-existent with the broncho-pneumonia.

In none of these cases of lobular pneumonia has the pathologist indicated that infarction and embolism had played a part in the lung picture, yet two of the autopsies are recorded as having been made on the second and fourth days respectively of the lung complications, a time at which the picture of embolic infarction, if present, might well be expected to have been noted. Abscess and gangrene are noted as having been found; there was no instance of effusion, either serous or purulent, complicating these fatal lobular pneumonias, subsequent to clean operations.

Concluding the summary of the autopsy findings it may be said, first, that the existence of pulmonary embolism and infarct in association with femoral or pelvic phlebitis is a picture clearly drawn; careful search in all the large

* Part I, *Can. Med. Assoc. Jour.*, July, 1926, xvi, 772.

† One instance of each.

veins of the body is imperative in the face of a fatally ending pulmonary embolism. Second, that a lobular pneumonia is the most common autopsy finding in the cases diagnosed as dying of lobular pneumonia; descriptions of infarctions are lacking in the autopsy notes dealing with this class of case. Third, that the proof of the actual existence of the minor embolus will always be difficult to establish. Fourth, that a condition suggesting massive collapse of the lung was noted as being present in two of the autopsies; and finally that pleural effusions must be looked on as unusual complications of the post-operative pulmonary lesions.

II. *Analysis of Post-Operative Pulmonary complications of Clean Surgical procedures According to the Clinical Evidence.*

A careful investigation of 125 case records showed that the pulmonary lesions subsequent to operation could be fairly sharply partitioned into the following classes:

(a) Cases occurring early in the post-operative period, within seventy-two hours, and showing the signs and symptoms suggestive of lobular pneumonia, bronchitis, fat embolism or massive collapse, (Chart I); these were divided into the following groups: lobular pneumonia and bronchitis, 84 cases; recovered 56; died 28; mortality 33.3 per cent. Fat embolism (suggested), 2 cases; recovered 0; died 2; mortality 100 per cent. Uncomplicated massive collapse, (suggested), 2 cases; recovered 2; died 0; mortality 0.

(b) Cases giving the history of an acute pleurisy, or showing the more evident signs of pulmonary embolism, and occurring later in the post-operative period than the pneumonic type of post-operative accident (after seventy-two hours) Charts II and III. The twenty-four cases of this group were divided into: minor emboli pleurisy, 12; recovered 11; died 1; mortality 8.3 per cent. Gross pulmonary emboli 12; recovered 1; died 11; mortality 91 per cent. The "minor embolus" fatality had recovered from his pleurisy (minor embolus) only to succumb to a later gross embolism; the recovery noted in connection with the gross emboli cases, and the physical conditions noted in his lungs suggest that an accident other than embolus caused his symptoms; a massive collapse was indicated by the signs presented.

(c) Cases more distinctly secondary in character: First, those cases of abscess and gangrene which ensued upon lobular pneumonia, bronchitis and embolus rather than upon foreign body inhalation, or upon the inspiration of infected or highly irritating secretions. Second, cases of effusions, serous or purulent. Of the effusions it may be said that they do not seem to follow the lobular pneumonia of the post-operative period; one serous effusion ensued upon a minor embolus; empyema was seen once as an association of abscess. These secondary lesions were met with as here detailed:—

Abscess subsequent to conditions suggesting lobular pneumonia or bronchitis, 6; fat embolism, 0; massive collapse, 0; minor embolism, 4; gross embolism, 0; gangrene, one instance only, and subsequent to a lobular pneumonia, 1; serous effusion subsequent to lobular pneumonia or bronchitis, 0; serous effusion subsequent to minor embolism, 1; serous effusion subsequent to fat embolism, massive collapse or gross embolism, 0; purulent effusions subsequent to lobular pneumonias or bronchitis, 0; purulent effusions subsequent to fat embolism, massive collapse or gross embolism, 0; purulent effusions in association with abscess, which in turn had seemed to have developed from a minor embolus, 1.

III. *The Clinical Course of Post-Operative Pulmonary Complications as seen in Clean Surgical Procedures.*

(a) *The lobular pneumonia and bronchitis cases.*—A temperature rising high even before the patient was completely recovered from the effects of the anæsthetic was frequently noted (c.f. cases 49434, 50538, 47062); the pulse and respiratory rate were usually rapidly elevated and in the course of a relatively few hours after the operation patients were reported as seriously ill (See Fig. 1). The early developing cyanosis in case 50358 with the signs of lobular pneumonia suggested the occurrence of fat embolism. Suddenly appearing dyspnoea in case 53213 suggested the diagnosis of thromboembolism, a diagnosis rendered less probable by reason of the patient's recovery and by the signs subsequently in evidence of displacement of the mediastinum. Displacement of the trachea and of the heart as recorded in cases 49369, 51039, 52051, 52572, 53213, indicate that with the pneumonic condition there had oc-

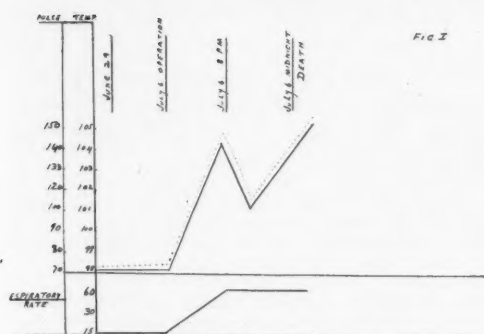


FIG. 1.—Rapid onset of symptoms in post-operative lobular pneumonia.

curring a collapse of the lung of greater or less degree. In the less severe types of lobular pneumonia a moderate fever range of from 101° to 103° lasting on the average six days, and ending by lysis, was the usual picture. The steady line of the fibrinous lobar pneumonia temperature was never in evidence and no crisis was observed; rusty or bloody sputum was noted but twice. It must be remembered that the bloody sputum of pulmonary infarct might easily pass as a sign of a pneumonic infection, particularly if co-existent with a painful minor embolus; also the occurrence of bloody sputum at a later time of convalescence would be in itself a happening most suspicious of embolic infarction.

Unlike the pneumonias of the medical wards, the post-operative lobular pneumonia rarely announces its onset with a chill; in three cases only were chills mentioned as having occurred. In one of these the chill took place three days after the pulmonary lesion was established and was due to the development of an abscess in the wound tract; in a second case, diagnosed as lobular pneumonia the chill was on the twelfth day after operation and signaled the occurrence of a fatal pulmonary embolism; in the third case a chill thirty-six hours after operation preceded the development of a consolidation in the left base.

Just as noticeably absent in the outspoken post-operative pneumonias, as were chills, was the detail "pleural pain", and one recognizes that neither chill nor pleural pain belongs to the inflammatory lesions of the early days and hours, but is usually something of the later stage of convalescence and is more suggestive of thrombosis and embolism. Of four cases

diagnosed as lobular pneumonia or bronchitis of the post-operative period, and having pleural pain as part of the condition, one has the following history: male, age twenty-nine, chondroma of the eleventh rib on the right side; resection; slight temperature for five days after operation, some few râles and rhonchi noted in the lungs; on the sixth day, acute pain in the left chest with the development of the physical signs of consolidation, and a history, which is that of embolism of the minor type rather than that of post-operative lobular pneumonia. Two cases were outspoken instances of pulmonary embolism with the pain occurring as late as the sixth and the eighth day, (52572, embolism of minor type and collapse; 53845, minor and gross embolism). The fourth case, number 45923, stands alone amongst the lobular pneumonias in having acute pleural pain as a feature of its onset, and even in this particular instance of "pleural pain in lobular post-operative pneumonia" the physical signs were entirely unilateral.

A striking feature of the course of all the lobular pneumonias, which ensued after operative procedures was, that in none was there recorded the occurrence of endocarditis, pericarditis, arthritis, peritonitis, arteritis, meningitis, nephritis, otitis, save in those cases which were badly infected at time of operation.

Phlebitis, when found, was not a happening clearly subsequent to a pneumonic process; it was never seen save as an unexplained post-operative phlebitis, or as the intimate associate of embolism. (cases 45469, 4319).

The high mortality of the post-operative lobular pneumonia has been noted; death was usually an incident of the early days and would seem best ascribed to toxæmia and anoxæmia, for cyanosis was a feature of the condition. In the recovered cases, lysis without complication was the rule. The one empyema recorded occurred late after an illness which suggested that an abscess had been present; one serous effusion which had only amounted to one c.c. of fluid existed in association with a collapse of the right upper lobe; the sudden onset of dyspnoea during the course of a lobular pneumonia had provoked the attempt at aspiration of the then completely consolidated right side;

the autopsy showed only lobular pneumonia and collapse.

The statement can be made that pleural effusions do not seem to accompany the pneumonic process which may follow clean surgical performances; they are in fact only to be looked for as an association of abscess or embolus. This tendency to escape the added handicap of effusion into the pleural sacs would almost seem to distinguish the pneumonia following a clean surgical procedure from one of the infectious type.

As further indicating the difference between the "surgical" and the "medical" pneumonias, can be mentioned the incidence of abscess of the lung in the cases whose histories suggest that suppuration has taken place in a simple inflammatory condition, rather than around an inhaled foreign body, or in an embolus which had become secondarily infected. Five instances of lung abscess and one of gangrene were found amongst the eighty-six cases whose clinical course had suggested post-operative lobular pneumonia, a considerably higher percentage of abscess than is looked for in the acute pneumococcus infections of the lung.

(b) *Cases which make up the group of "minor emboli,"* cases with acute pleural pain and signs of a localized lesion in the lungs, the complete picture developing late during post-operative convalescence.

Absence of symptoms of respiratory or cardiac distress is the rule for several days immediately after the operation. The existence of an unexplained slight elevation of temperature and pulse rate for some days is usually demonstrable; suppuration in the wound tract may be suspected and the incision re-opened;* a period of complete well-being usually follows the primary fever wave, and is terminated by the onset of acute pleural pain, after which a small area of consolidation and a pleural rub can be demonstrated in most cases. The pleurisy may be re-produced on the other side; dyspnoea, cough and a short fever wave ensue with a moderately increased pulse rate; bloody sputum is not often seen (case 45910). The most typical instances of these pulmonary complications show evidence of a femoral phlebitis at the time of the first pleural attack

or a few days later. These cases are of such an unusual nature that their accurate delineation is desirable and their labelling as instances of pleuritis in association with minor emboli is urged. The details of some of the most typical of these cases might be given.

Case 4319. Female; age twenty-one. Appendectomy under ether. Slight fibrosis of the appendix was found but no inflammation. After operation slight fever for six days which fell to normal for one day, then pleuritic pain and a pleural rub occurred on the right side with temperature of 100° lasting one week. An impaired percussion note and distant sounds were noted on the right side over the site of the pleural pain. On the seventeenth day, phlebitis of the left leg; on the twenty-fourth day an attack of pleurisy with pain again on the right side; recovery.

Case 51021. Male; age forty. Gangrenous appendix, operation under ether, slight temperature before operation reaching 100°, remains elevated for eight days, drops to normal; then pain in the right side with friction rub; recovery.

Case 52372. An infected case at operation and one in which the early fever of thrombosis would be hidden by the fever of infection. Female; age thirty-three. Pyosalpinx, pelvic peritonitis, incision and drainage under ether. The fever which was present at operation fell in four days and temperature was normal for two days. On the sixth day there was sudden pain in the chest with dyspnoea, there was found a pleural rub with signs of consolidation on the left side. Complete recovery.

Viewed from the clinical side it is apparent that the extreme urgency, the collapse, the quickly developing signs of cardiac and respiratory failure belonging to the gross emboli are not as a rule so much in evidence in these minor emboli cases as is the acute pleural pain. It may be said as before suggested, though with many reservations, that the persisting pleural pain goes hand in hand with persistence of life and reaction. No distinct instance of collapse of the lung was associated with this group of minor emboli; a

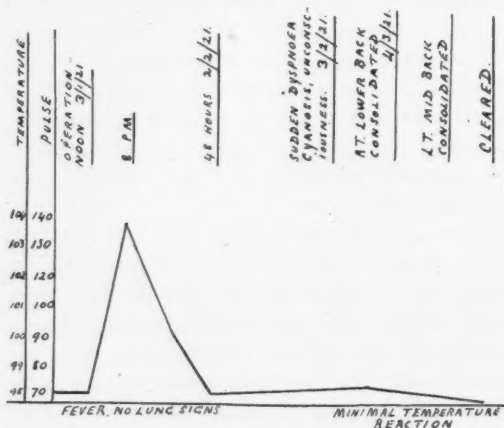


FIG. 2.—Embolism. Recovery. Called pneumonia.

* As in the case whose chart is given as Fig. 3.

distinctly demonstrable consolidation is not the rule; a pleural rub is often the main evidence of pleuro-pulmonary involvement; a large effusion (sterile) followed in only one instance.

The usual tendency of these cases is to declare themselves by pleural pain or rub; they may however be singularly unostentatious in their arrival and almost lacking in their temperature reaction (Fig. 2). Conner has demonstrated how often latent pulmonary lesions exist with the phlebitis of typhoid fever; a study of his descriptive cases shows how closely the course of the post-operative minor emboli cases resembles that of his "pulmonary manifestations of typhoid phlebitis." Resolution without complication is the rule; the history of four of the "abscess of the lung" cases, however, indicates clearly that even without the suspicion of being a carrier of infection, the minor embolus may terminate in suppuration of the lung. (31337, 5509, 2666, 29444). The two accompanying sketches (Figs. 3 and 4.) show well the early

(c) Clinical course of the gross, fatally ending, emboli.

The classical picture of pulmonary embolism need hardly be retraced: death, sudden and unexpected, is the tragically simple sketch in no less than five of the cases of embolism; dyspnea, sudden in onset, with oppression rather than sharp pleural pain, cough, rapidly rising pulse rate, symptoms of shock and exhaustion, may at times be more positively identified in those cases whose death has been postponed for some hours. Cyanosis may or may not be present; a mucoid expectoration was observed in one instance; the bloody sputum of infarct is probably associated only with those cases who survive the primary shock by many hours. The rapid, weak pulse and signs in connection with the heart may suggest a diagnosis of some form of cardiac failure, such as dilatation or the various conditions of tachycardia. Should there be time for the development of pain in the anterior situation, coronary thrombosis may be suspected; "abdominal hemorrhage and shock" was the suggestion in one case (54035) and the abdomen has been re-opened in cases of pulmonary embolism, whose symptoms suggested hemorrhage and shock rather than a lung condition. It is very evident, since signs common to both cardiac and pulmonary involvement will be present, that the determination and delimitation of the actual condition will be difficult. The fact that an abdominal operation has preceded the sudden death or urgency, the persistence of an unexplained fever after operation, the co-existence of a femoral phlebitis, are all details pointing suggestively in the direction of an embolic cause for the debated accident. Neither a pleural rub, or a localized consolidation was detected in any of our cases which ended fatally—a turmoil of râles and over-active respiratory sounds conceal the true condition. "A pain in the left chest," "pain at mid-sternum at third costal cartilage" in two cases, had no accompanying pericardial rub to suggest a coronary thrombosis; a diagnosis which must be suggested under the circumstances. The latter of these two cases coming to autopsy showed only embolism of the pulmonary artery and infarct. The co-existence of smaller emboli and massive collapse must be considered. Case 53213 listed as

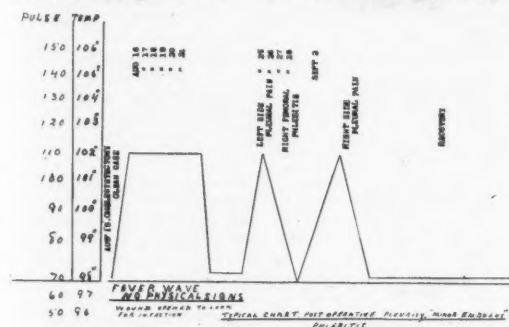


FIG. 3.—Typical chart, post-operative pleurisy, "minor embolus," phlebitis.

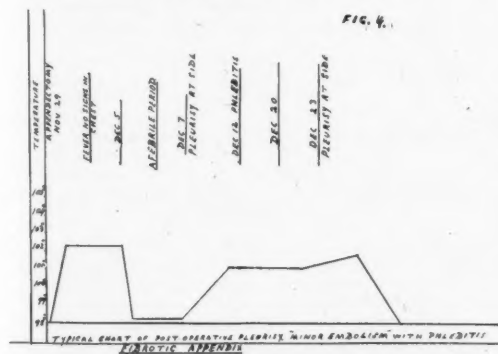


FIG. 4.—Typical chart of post-operative pleurisy, "minor embolism" with phlebitis. Fibrotic appendix.

fever wave, the drop to normal, and the late occurring pleurisy; in both cases the causal phlebitis was in evidence.

pulmonary embolus, but to be described later amongst the "collapse-of-the-lung cases", is suggestive of this happening, and the recovery recorded here may make one question as to whether embolus was the actual condition present.

Fever beginning with the operation and dropping to normal before the fatal outcome was a feature in seven of the twelve cases listed as gross pulmonary embolism and as has been before insisted upon, this fever without evident

signs of infection, called by some "the fever of thrombosis" is a frequent forerunner of the embolic incident, and its disappearance is no guarantee of the patient's well-being. In Fig. 5 is drawn what might be called the more or less typical course of fatal pulmonary embolus subsequent to operation.

The details of eleven operative cases diagnosed as pulmonary embolism either at the time of the accident or, as in case 10, in the subsequent revision of the history, are charted in Fig. 6. The large proportion of these cases of sudden death from the gynæcological service bears out the statement of one author that pulmonary embolism is a common cause of death after the removal of large uterine tumours. It is apparent that the emboli have a preferred time of late appearance.

IV. Less Readily Recognizable Post-Operative Pulmonary Complications.

Any classification of post-operative pulmonary complications should include detailing of such

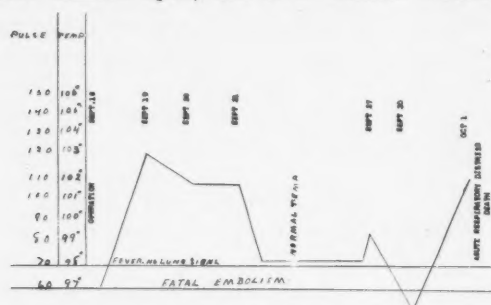


FIG. 5.—Fatal embolism.

Nature of operation	Fever	Death	Notes
1.—Hysterectomy. Case No. 45469	Slight before operation.	Sudden, 5th day.	Sudden onset of acute dyspnoea.
2.—Hysterectomy. 7989	None.	Sudden, 10th day.	No symptoms noted.
3.—Hysterectomy, fibroids. 54463.	Slight before operation.	Protracted to a few hours, 10th day.	Pain at third costal cartilage, phlebitis of pelvic veins, femoral veins and veins of broad ligament.
4.—Salpingectomy and Ovariectomy. 54035	Slight after operation.	Protracted to a few hours first day.	None noted save that of "sudden death."
5.—Hysterectomy, tumour. 51850.	Slight for five days after operation.	Sudden, 9th day.	"Thrombosis in pulmonary arteries."
6.—To have:—Cystocele repair. "No operation." 53572.	None.	Sudden, 4th day in ward.	Embolism of pulmonary artery, thrombosis of hypo-gastric veins.
7.—Removal of varicose veins. 52769.	None.	Sudden, 4th day.	No notes save that of sudden death.
8.—Ventral hernia repair. 48702.	Slight for two days after operation.	Sudden, 3rd day.	Cyanosis and dyspnoea.
9.—Gastro-enterostomy. 51770.	Began in 24 hours, lasted 3 days, normal 2 days.	Sudden, 12th day.	Chill and dyspnoea preceded death.
10.—Gastro-enterostomy. 53845.	Slight for ten days after operation.	Sudden, 11th day.	Preceded by an attack of minor embolism.
11.—External urethrotomy. 49718.	Slight fever falls with operation.	Sudden, 18th day after operation	Phlebitis 16th day.
12.—Amputation of breast. 53213.	For four days after operation.		Recovered. Lung signs on second day. Consolidation and heart displaced to right. Question as to massive collapse.

FIG. 6

conditions as fat embolism, the acutely occurring instances of massive collapse and of acute mediastinitis. No such diagnoses were made in the three years' records covered by this investigation. Fat embolism is suggested by the history in case 48399, (a cranioplasty) from the nature of the operation with the accompanying chipping and hammering of the bone; and much more particularly in case 50538, (an operation for ventral hernia repair using living suture) which was followed by immediate collapse and death. These are the types of operations which are most often credited with the causing of fat embolism. (Park: Bissell). Cases 51039, 53213 and 52572 with the actual dislocation of the mediastinum recorded, create the suspicion at least that the condition of collapse of the lung does occur as a post-operative pulmonary lesion. Their details are as follows:

Case 51039. Carcinoma of transverse colon; entero-enterostomy; elevation of temperature, pulse rate and respiratory rate after operation; the note is made that with the lung signs of consolidation the "trachea is drawn to the left".

Case 53213. Radical operation on the left breast; slight temperature next day, pulse rate 140, this disturbance lasting four days. Four days later sudden onset of extreme dyspnea and cyanosis, physical signs vague as wounds prevent complete examination, but heart is noted as one inch to the right of sternum, the patient recovered. As above noted the diagnosis of embolism in this case seem open to question.

Case 52572. Double pyo-salpinx; pelvic peritonitis incision and drainage; slight temperature fell in four days to normal; on the sixth day pain in chest, signs in both bases, and note says "apical impulse in axilla." This though an infected case is here quoted and detailed to illustrate the conditions which must be held to suggest massive collapse.

V. *The Life Expectancy and the Condition of the Patient as Regards Probable Recovery from the Actual Operation in Cases Subsequently Affected with Post-Operative Pulmonary Complications.*

A. CASES CONSIDERED AS VERY GOOD RISKS.

No.	Average age	R	D	Pneumonia; Broncho-Pneumonia	Minor emboli	Embolism-Thrombosis	Abscess
38	37	29	9	25	5	3	5
			Deaths—	4	0	3	2
						Percentage of mortality23.6	

B. CASES CONSIDERED AS MERELY GOOD RISKS.

No.	Average age	R.	D.	Pneumonia; Broncho-pneumonia	Minor Emboli	Embolism-Thrombosis	Abscess
35	37.6	26	9	27	2	3	3
			Deaths—	6	0	3	0
						Percentage of mortality25.7	

C. CASES CONSIDERED AS DOUBTFUL RISKS AT OPERATION.

No.	Average age	R.	D.	Pneumonia; Broncho-pneumonia	Minor Emboli.	Embolism-Thrombosis	Abscess
34	51.8	13	21	26	0	3	5
			Deaths—	15	0	3	3
						Percentage of mortality61.7	

Whether the subject be labelled "questionable risk," "good risk," or "very good risk," it is clearly evident that he is liable to post-operative pulmonary complications and the further away he is from the rating "very good" the more terribly apparent the seriousness of the outlook in the ensuing complication. To realize that a strong adult who acquires a lung complication after an operation runs a 20 per cent risk of death even if he is a perfectly clean case indicates clearly the gravity of the complication. Deaths from broncho-pneumonia subsequent to operation were recorded as terminating the following more or less quiescent complaints in distinctly young and vigorous people.

1. Sub-acute cholecystitis and appendicitis: age fifty-one.
2. Chronic appendix, pathological record of fibrosis: age twenty-one.
3. Appendix operation, pathological record of "nothing found": age twenty-six.
4. Ventral hernia repair: age thirty-four.
5. Sub-mucous resection, development of lung abscess: age forty.

The absence of minor emboli as a cause of death is noteworthy. This has already been touched upon in discussing the prognosis of post-operative pulmonary complications. A very typical case of minor emboli with accompanying phlebitis is recorded as following an operation for appendectomy in one case, the pathological report showing no change in the removed appendix. Three deaths from embolus, in young adults, raise the mortality percentage in those cases labelled very good risks. An operation for varicose veins of the leg in a man sixty-five years of age brought

low by hæmorrhage, and an operation for cystocele in a woman of sixty-one would seem to be conditions in which expectancy might be labelled questionable, and emboli ending fatally in these cases, help to make the shocking mortality figures of post-operative pulmonary complications in the so-called poor risks.

VI. *Nature of the Operation and the Type of Pulmonary Lesion.*

The predominance of the abdominal operation as a detail in the history of a post-operative pulmonary complication has been noted. The close association of abscess with nose, throat and mouth operations and of gross embolus with operations in the pelvis is clearly evident; appendectomies, operations on the biliary tract, gastro-enterostomies, make up the largest percentage of abdominal operations and they show the greater relative incidence of broncho-pneumonias. Minor emboli are recorded most frequently subsequent to appendectomy, hysterectomy and salpingectomy. One cranial plastic operation No. 48399 was complicated by a rapidly developing and fatal broncho-pneumonia; the isolated instances of fat embolism recorded in literature are often found to be in association with such procedures, and fat embolism should be thought of when considering any acute pulmonary affection developing subsequent to operation upon bones. The same remark applies to pulmonary conditions developing after operations which require dissecting or manipulating of fatty tissues such as the breasts or the abdominal wall. The acuteness of onset of the symptoms of fat embolism and the special pathological technique necessary to demonstrate the actual lesion were well put before the profession many years ago by Roswell Park. Massive collapse is spoken of as more closely related to operations nearer the diaphragm.

VII. *Relation of Anæsthetic to the Post-Operative Pulmonary Complications.*

The operation, rather than the anæsthetic, determines the occurrence of the post-operative pulmonary complications (Steinach). In three years, at the Toronto General Hospital 17,000 general anæsthesias with ether, in all types of surgical procedures were followed by 200 post-operative pulmonary complications, 1,700 local anæsthesias by five post-operative pulmonary complications. The 5,000 abdominal

operations under general anæsthesia contributed the great majority of lung involvements, largely (65 per cent) broncho-pneumonic in nature. During these years there were about 200 major operations done under a local anæsthetic; four post-operative pulmonary complications are recorded after abdominal operations with this particular type of anæsthesia, and one followed an operation on an extremity. As recorded above, one of these pulmonary accidents, case 49471 was six weeks after operation. Case 48942, an operation on the extremities, is very definitely a case of minor embolism with pleurisy fourteen days after operation. In No. 51039 the rise of temperature, pulse and respiratory rate does not begin till seventy-two hours after operation, the consolidation is unilateral (left side) and the "trachea is drawn over to the left." Such physical findings suggest rather a collapse of the lung than broncho-pneumonia. The diagnosis in the remaining two cases Nos. 51347 and 52051 is "bronchitis", one can only wonder how two hearty adults develop after a local anæsthetic an irritative lesion of this sort; fat embolism might be suggested as the cause in one, a rapidly developing diffuse bronchitis immediately subsequent to a herniotomy, while in the second, a resection of a rib chondroma, fat embolism might account for the early symptoms, and thrombo-embolism for the pain in the chest with the signs of collapse of the lung five to six days later. Gas and oxygen had been used to supplement the local anæsthetic in the latter operation.

It is quite evident that the giving of local anæsthesia may be followed by post-operative pulmonary complications though in a lesser percentage of cases than is seen after a general anæsthetic. Such complications after local anæsthetic will most often be of embolic nature. In considering the cases diagnosed as acute bronchitis or lobular pneumonia and occurring immediately after operation with local anæsthetic, one must naturally assume that either some irritant has arrived into the lung, or that the patient, depressed by the operative procedure, has contracted cold or a lung infection. Fat embolism or multiple emboli to the lungs would fit in well with the first assumption; fat embolism or minor emboli probably account also for many of the acute broncho-pneumonic

accidents seen in association with general anaesthesia.

VIII. Seasonal Incidence of Post-Operative Pulmonary Complications.

Emboli are naturally not dependent upon the change of seasons nor upon questions of prevailing infections; only the lobular pneumonias and the bronchitides show the effect of the winter and spring months upon their incidence. The charted figures of the number and types of pulmonary complications, with the months of their occurrence suggest that the season of acute respiratory infection is the least favourable time for operative procedure. It should not be forgotten that the summer months are often a period of comparative quiet in the surgical wards, but even with this allowance made, the incidence of the acute irritative lesions seems greater between the months of October and May.

	Lobular pneumonias and bronchitis	Minor embolism	Gross embolism
January	3	4	1
February	9	1	1
March	13	1	1
April	16	1	0
May	8	0	0
June	8	0	2
July	3	0	0
August	4	1	0
September	4	3	2
October	4	0	0
November	8	1	3
December	1	0	2

IX Abscess Subsequent to Operation.

As stated above, a large percentage of the cases of post-operative pulmonary abscess occurs subsequent to operation in mouth, nose and throat. Such cases must be of the nature of an aspiration lobular pneumonia with subsequent breaking down of the lung tissue. Some infective foreign body is naturally thought of as a cause of this condition. In none of the five of this type of case (3 teeth extractions, 1 tonsillectomy, 1 sub-mucous resection) was any foreign body detected. The fragments of tartar from dirty teeth with their heavy load of spirilla may be the cause of these lung infections. Tees has reported such a case, and spirillar infections of the respiratory tract have come to be recognized as a definite entity. Even without anaesthesia an infection may occur (Tevinski 28142). Abscess subsequent to gastrostomy for relief of carcinoma of oesophagus might be classed with the inhalation abscess. One such case with signs developing twelve days after operation is on our list. Abscess

of the lung however is a not infrequent complication of carcinoma of the oesophagus that has not come to operation, and to relate an abscess of this nature to a preceding operation is questionable. Two abscesses which followed confinement and surgical abortion suggest that emboli from the uterine and pelvic veins had lodged in the lungs and become infected. There was no femoral thrombosis in these cases. The pelvic veins and uterine sinuses must always be considered as a breeding place of thrombi, infective or non-infective. Secondary infection of the infarcted lung area from aspiration during narcosis is the probable determining process in the abscess formation. Cases of this sort suggest that a similar process was in operation in No. 31337 and 5509, solitary abscesses, one developing with pain shortly after operation, the other developing after three days. The infrequency with which after operation the condition of multiple abscess of the lung occurs is noteworthy; it was never detected clinically. The autopsy records of one case No. 52309, detail multiple abscesses in an acute diffuse lobular pneumonia. If lobular pneumonia subsequent to operation is an aspiration irritative process, the irritant matter must usually lack the organisms which induce lung destruction.

Summary

Post-operative pulmonary complications may be looked for after any operation even in perfectly clean cases considered as good risks. They are most usual after operations on the abdomen and the mortality is high. Operations on the extremities, removal of varicose veins, dissections, chipping of bone, all have been followed, however, by acute post-operative pulmonary complications. Thrombo-embolism has seemed the evident cause of these complications in most instances, fat embolism can be suspected in others.

Lobular pneumonia is the lesion most commonly met with, and when the embolic accidents are removed from consideration, it appears that operations done under general anaesthesia are more liable to be followed by this form of pulmonary irritation than those done under a local anaesthesia.

The proper classification (diagnosis) of post-operative lesion is essential to make clear this point. A seasonal incidence is apparent in the lobular pneumonias following operations. The

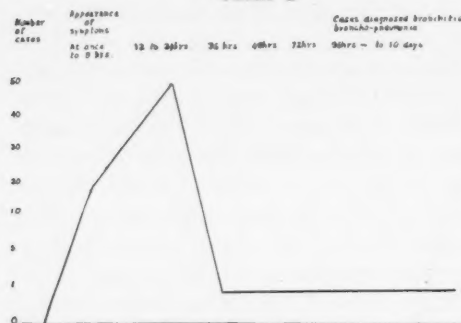
clinical course of post-operative lobular pneumonia differs in some particulars from the usual infectious lobular pneumonia.

There are three groups of post-operative pulmonary complications: first, the early irritative lobular pneumonia, fat embolism, collapse of the lung; lesions of the first seventy-two hours; Chart I; second, the gross embolic, late in onset after

in absence of any operative complications should excite suspicion of thrombo-phlebitis.

The use of the term "minor embolism" in diagnosis is urged; fever after operation followed by pleurisy with pain is suggestive of this condition, as pleural pain is rarely noted in post-operative broncho-pneumonia or gross embolus. The consolidation found with these pleuritis is a result of infarction. Cases with acute pleural pain usually recover.

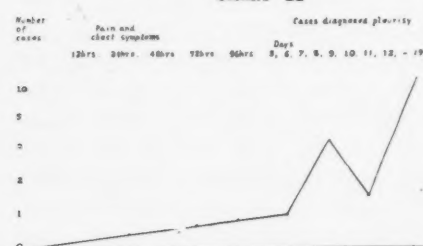
CHART I



The period in hours after operation in which "irritation lesions" appear.

the operation, usually ending fatally and one of the chief causes of sudden death after operation, Chart III; third, the minor embolic, also occurring late after operation; signalized by a pleural pain and by a less evident severity of their course. Chart II.

CHART II

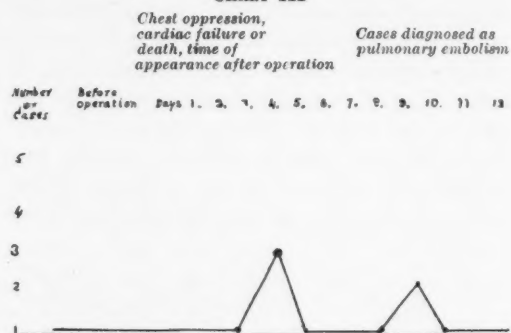


The period after operation, in hours and days, in which acute pleuritis tends to appear.

Empyema and pleural effusions are unusual sequences of broncho-pneumonia or emboli; abscess occurs after post-operative broncho-pneumonia in a somewhat higher percentage than it does in infective broncho-pneumonia, abscess may follow non-fatal embolic infarction; aspiration is the main cause of abscess.

Early fever after operation, late occurring lung symptoms, pleural pain, sudden death, should suggest embolism; a phlebitis in association with such conditions completes a well known picture. Early fever and no lung signs

CHART III



Time in hours and days in which gross emboli tend to appear.

Fat embolism and massive collapse of the lung are titles which should be included in any study of post-operative pulmonary complication. A unilateral consolidation should always suggest collapse or infarct. The position of the heart, trachea and diaphragm must always be determined in any case of consolidation, or massive collapse will be overlooked.

Many causes are probably associated with the production of post-operative pulmonary complications. The relation of most abscesses of the lung to inhalation seems clear; minor and gross embolism, one fifth of all post-operative pulmonary complications, come from thrombosis which is more often hidden than visible.

The seasonal incidence of broncho-pneumonia suggests that the shock of the operation, heat, loss, or exposure, may predispose a patient to a prevailing infection; if this be so, there should be a greater incidence of proven lobular pneumonia after the use of local anaesthesia. Minute emboli, thrombi or fat particles from the site of the operation may lodge in the lung in numbers and cause numerous small infarctions; the inhalation of the ether and inhaled secretions added to these infarctions may de-

termine the post-operative broncho-pneumonia. The giving of interstitial saline injections into the chest tissues has been accused of helping to produce post-operative lesions. One feels that the interference with respiration produced by an abdominal incision would materially further the development of congestion and inflammation. Cardiac weakness may play a part. Fat embolism probably explains a certain number of the very acutely developing broncho-pneumonias. Massive collapse should be suspected in unilateral consolidations with severer symptoms.

The classification and the incidence of post-

operative pulmonary lesions can be arranged as follows:

1. Primary lesions: Lobular pneumonia and bronchitis, 63.06 per cent. Minor embolism, 19.08 per cent. Gross embolism, 10.8 per cent. Massive collapse, 4.5 per cent. Fat embolism, .18 per cent. Mediastinitis.

2. Secondary lesions: Abscess and gangrene, infarction, serous effusions, purulent effusions.

No special line of treatment can be urged; embolic lesions cannot be foreseen or prevented in any clinic; the most exacting care in the pre- and post-operative period fails to prevent the occurrence of broncho-pneumonia in a small but fairly fixed percentage of cases.

THE PROBLEM OF THE ACUTE EAR*

By T. RITCHIE RODGER, M.D., F.R.C.S.

Surgeon Ear, Nose and Throat Department, Hull Royal Infirmary

WHEN I received from your council a kind invitation to address this annual meeting it was suggested that I should choose some subject comprised in the specialty I practice and at the same time one of interest and importance to the general practitioner. I think the subject placed on the agenda meets these requirements.

I use the term "the acute ear" in the same sense as the general surgeon does when he speaks of "the acute abdomen" and for the same reason. Neither term can be acclaimed as an accurate use of language, but both are justified as arresting the attention and labelling a condition which demands immediate and careful treatment as contrasted with a policy of laissez-faire. I understand that the term "acute abdomen" includes a variety of conditions but has come to be accepted as the indication of a state of affairs demanding either immediate operative interference or a concentrated and alert attentiveness till a decision can be arrived at. Exactly so much do we claim for the acute ear.

There has been in recent years a great awakening on the part of the profession and the public

to the importance of signs of acute inflammatory conditions in the middle ear. Previously, the otologist rarely saw an acute otitis media in its early stage. The cases which reached him were those in which spontaneous rupture of the membrane was long delayed, or those in which such rupture was not followed by relief of pain, or those in which definite mastoid symptoms had already supervened. Nowadays every otologist has among his clientele some practitioners who seek his help immediately after their first attendance on a case of earache.

I do not propose going into much detail about the symptomatology of the condition. It is seldom obscure except in the case of very young children who are unable to locate their pain, but the ear should never be forgotten in the search for the focus of discomfort in a persistently crying child.

In almost all other cases the pain is definitely referred to the ear, and inspection of the drum-head will show injection probably with boggingness and loss of lustre and possibly with bulging from the pressure of serum or pus in the middle ear. There will probably be also a certain amount of deafness. If none of these changes in the membrane are present the ear-

* Read before the Canadian Medical Association, Victoria, June, 1926.

ache may be due to a furuncle in the canal and this should be carefully sought for. As a rule furunculosis gives greater pain on pressing the tragus than the mastoid process and the canal is tender to the speculum. Referred earache may be due, as in a middle aged patient of mine, to an acute affection of the antrum of Highmore on the same side, or as in two young women I saw recently, to a neuralgic condition associated with influenza. The temperature in otitis media is very frequently raised, but is never a reliable guide. Tenderness over the mastoid process is more important, and should be carefully searched for in every case—not in a perfunctory manner, but carefully and deliberately. There are three situations to be carefully palpated, the extreme anterior part of the tip of the process where a large tip-cell is usually situated, the posterior surface slightly higher than the tip, and the region of the antrum. In the case of a child the face should be watched for involuntary twitching when firm pressure is being exerted.

Treatment.—Having determined that we are dealing with a case of acute inflammation of the middle ear, with a tympanic membrane altered from the normal, unless such alteration is merely a simple injection without loss of lustre, it may be almost categorically stated that the condition calls for immediate incision of the membrane.

In so doing we are merely anticipating nature's method of relief. The condition is an infection of the middle ear, almost invariably associated with the exudation of serum or pus, and the symptoms call for evacuation of the exudate. But in children the acute ear is almost always associated with adenoids and these if present should be removed at the same time. My own custom is not to palpate the nasopharynx for diagnostic purposes beforehand. The treatment of the ear demands a general anæsthetic in any case, and the finger can then in comfort be slipped up behind the palate, and the operation of removal carried out immediately.

The procedure I find most simple and effective is to fill the canal with spirit when the anæsthetist begins his administration and to swab the auricle at the same time. The hands and all instruments used must of course be scrupulously sterilized. When the patient is anæsthetized, the canal is mopped dry by means of

sterilized cotton wool on a fine probe and the incision is carried out through as large a speculum as the canal will admit, and under a good reflected light. A free incision is made in the posterior segment of the membrane and as a rule serum or pus escapes. Occasionally only blood is seen and the discharge is found to be purulent in a few hours.

Personally in the case of children, I always sterilize a gag and adenoid curettes with the paracentesis instruments, and I nearly always use them. When the ear has been dealt with, the head is hyperextended over the end of the table, or a pillow is pushed under the shoulders so that the head falls back. The nasopharynx is then palpated, and if necessary, as it nearly always is, treated. I never interfere with tonsils, however large or infected they may be. We are dealing with a sickly child; and our purpose is to control the ear condition, with which the faucial tonsils have little or nothing to do. It has to be remembered that all the systemic disturbance which ordinarily follows the tonsil and adenoid operation has to be debited to the tonsil part of it. The large raw surfaces of the tonsil beds are the seat of pain with every movement of deglutition. When adenoids alone are removed the patient has practically no pain, and can take food almost immediately afterwards. For this reason one has no compunction in attacking adenoids while doing the paracentesis.

One need have no fear of incising the tympanic membrane on the score of the incision not healing. The difficulty is rather to keep it open long enough to effect its purpose. The danger of non-healing is infinitely greater if we wait for spontaneous rupture. Nature's method of relieving a middle ear suppuration is the sloughing of a smaller or greater area of the membrane and this, from its shape and size may render subsequent healing very problematical. The linear incision made with the knife almost never fails to heal.

Let us revert for a moment to the question of mastoid tenderness. This, until recent years seems to have been considered the one symptom calling for operative interference. As long as tenderness over the mastoid process could not be elicited the condition was looked upon with equanimity. There is a double fallacy in this position, for there may be a middle ear urgently demanding evacuation without tenderness being

present, and on the other hand tenderness may be evident only to a much more detailed search than is often accorded to it. Some otologists have held the view that mastoid tenderness is always an indication for an immediate mastoid operation, urging that this is the only really safe rule of treatment. One of my friends who studied under Neumann in Vienna over twenty years ago has told me that he once asked him why he did not include paracentesis among the procedures taught in his operative class.

The reply was that in Neumann's opinion where paracentesis was indicated a mastoid operation should be done. Personally I cannot subscribe to such a view. Last December, for instance, during an influenza epidemic, I performed incision of the membrane twenty times and in nearly every case mastoid tenderness was present, and yet only two cases proceeded to mastoid operation. In a recrudescence of the disease three months later, however, out of twenty-seven paracenteses fifteen required the larger operation and in the same epidemic ten other cases on account of the severity of the symptoms were immediately subjected to mastoid operation without a preliminary trial of paracentesis. In this second epidemic, another evidence of the greater virulence of the infection was the fact that more than one-third of the wounds failed to heal by first intention.

We must take it that the early tenderness is due to a simple hyperemia of the mucosa of the cells and the overlying soft tissues from a determination of blood in the direction of the pus in the middle ear—nature's rallying of her forces to limit the invasion. Evacuation of the middle ear by paracentesis leads in the fortunate cases to speedy resolution of this hyperemia with disappearance of the tenderness—but if the change in any of the cells has proceeded beyond simple hyperemia such resolution does not take place.

When paracentesis has been done, with or without removal of adenoids, the further progress of the case will bring it into one of three categories. First, we have the happy class in which immediate relief of pain is obtained with speedy recession of the mastoid tenderness. The ear goes on discharging for a variable time and is kept clean by frequent mopping followed by the instillation of ear drops consisting of boracic acid in spirit. In the second class, no

benefit is obtained, pain and temperature continue and the mastoid tenderness is as before. In such cases the mastoid operation should be advised with very little delay.

The third class, coming between the other two classes in order of severity, is often the most difficult to deal with. Paracentesis is followed by considerable relief of all the symptoms—the temperature falls, earache disappears, and tenderness is markedly less, but even after some days there can be elicited some tenderness at or behind the mastoid tip. The general condition is so much improved that the medical attendant may have difficulty in suggesting further operation. But in such cases the mastoid should be opened every time.

Several years ago I encountered about the same time two cases illustrative of this type. One was a nurse in Hull Royal Infirmary in whose case paracentesis gave marked relief for a few days and a repetition of the procedure on recurrence of the pain was again of such benefit that at the end of one week from the onset of the illness she asked to be allowed to return to duty. She was much surprised when I advised operation on account of some continued tenderness on deep pressure on the posterior surface of the mastoid tip. Operation revealed only granulations in the upper cells and antrum but in the lower part of the mastoid half a square inch of the dura of the sigmoid sinus was lying exposed, bathed in pus. The other case was exactly similar. The patient was a man of fifty whom I watched for a week during which time paracentesis was done twice. At the end of that period he was so well that he protested against operation but here again the lower part of the sinus was the seat of an extensive extradural abscess. Both cases did well, but since then I have never done paracentesis a second time and I consider that any tenderness remaining more than two or three days after incision of the membrane is an absolute indication for opening the mastoid. If the early tenderness is due to simple hyperemia, it should be gone in a few hours after evacuation of the middle ear.

What seems to happen in these cases, is that as a result of the incision of the membrane resolution occurs in most of the hyperemic mastoid cells, but some of the larger and more deeply placed cells fail to resolve.

Probably the size of the cell is the chief determining factor. The large tip cell is very frequently the only cell containing pus. Perhaps this is analogous to what we find in the nasal accessory sinus where after an influenzal sinusitis the large antrum of Highmore yields a quantity of pus when the small ethmoid cells have resolved.

Then we have to consider the cases in which spontaneous rupture of the membrane has occurred before the surgeon or the medical attendant sees the case. Speaking generally we should look upon such spontaneous rupture as taking the place of our paracentesis, and follow the rule already laid down. If discharge began more than a few days before, and if tenderness or earache or temperature indicate non-relief of symptoms by the rupture, then a mastoid operation is indicated. The only reservation one might make is that if inspection of the membrane reveals a perforation too small or too highly placed for effective drainage, and if a mass of adenoids be present, it may be considered worth while to incise the membrane and remove the adenoids and give the patient one or two days' grace, but the time limit must be even more jealously guarded in these cases than in the others.

Mastoid operation.—When the case demands a mastoid operation, the procedure is that generally known as Schwartz's operation.

The radical operation is never justifiable in the class of case we have so far been discussing. When the acute inflammatory condition is an implantation on a chronic suppurative otitis media that is another matter and the radical operation will probably be required. It is always important to make a point of ascertaining in each case whether there has been a long-standing discharge from the ear before the onset of the acute symptoms, because in these cases of exacerbation of an old chronic condition not only is the radical operation indicated but the urgency is also greater, as also is the likelihood of there being an intracranial complication already present. I am not concerned in this address with the question of chronic otorrhea except in so far as an exacerbation may for the time being bring the case into the category of acute ear, but I wish to emphasize that when an acute ear is of this type it brooks no delay. Mastoid operation is urgently required

and before proceeding with it a very detailed examination of the case should be made to determine as far as possible whether one is likely to meet with an extra-dural or intra-dural abscess, a sinus thrombosis, labyrinthitis or meningitis.

To return now to the mastoid operation in the acute ear proper, it cannot be too strongly emphasized that although in the Schwartz operation the middle ear is not interfered with and the posterior bony wall of the meatus is not removed, the operation is a complete mastoidectomy and not merely a mastoidotomy. Every now and then one reads in some text-book that "all the infected cells should be thoroughly opened." In my opinion, if we are to expect uniformly successful results, every mastoid cell whether obviously infected or not, should be completely obliterated. How are we to ensure that cells which appear clean are really uninfected, and how can we effectually avoid the possibility of clean cells becoming infected during the operation?

Once infected, a bone cell can with difficulty undergo spontaneous cure. An abscess in the soft tissues heals after simple evacuation by collapse of its walls and the subsequent organization of scar tissue between these, but a bone cell cannot collapse; only surgical obliteration can be relied upon for its cure. There should be no bone cells left at all—they should be ruthlessly followed in every direction till sclerotic bone is reached. The sinus plate should be shaved clean of cells, and the dural plate of the middle fossa equally so. Any cells extending superficially posterior to the sinus should be removed, also the tip cells and the deep gutter of small cells running up from the tip to the antrum between the posterior bony meatal wall and the sinus plate. Special attention should be paid to the posterior root of the zygoma which may be cellular for half an inch or more of its length. It must be remembered that if one scamps in any degree the complete exenteration of the mastoid process, the cells untouched are likely to be the most important,—those in closest relation to the sigmoid sinus or the dural plate of the middle fossa. It is better to expose the dura than to leave any doubt about superjacent cells, and for my part I uncover the dura of one or both fossæ in a very large proportion of my cases.

At the close of the operation, my present custom is to cleanse thoroughly with peroxide, carefully remove any loose spicules of bone that may have escaped attention, cleanse again with spirit, rub in bismuth and iodoform paste, and stitch up completely. Healing by first intention generally occurs; if it does not, one or two of the lower stitches can be removed, and if occasionally the whole wound breaks down, we are only back to the old procedure we used to follow before stitching up was introduced. After-treatment is directed more to the middle ear than to the mastoid wound. Careful mopping once or twice daily, followed by the instillation of spirit, or spirit with boracic acid as a rule gives a dry ear within a week.

Again, one has sometimes to proceed to the mastoid operation immediately on account of signs of meningeal irritation—and in all cases the reflexes should be carefully watched for such signs. There may be high temperature, headache, retraction of the head, delirium and a suggestion of Kernig's or Babinski's signs. In two cases I have seen these last named signs and the *tâche cerebrale* confined to the limb on the opposite side from the infected ear. Where such meningeal signs are seen early the mastoid operation is urgently required, but in my opinion nothing more should be done in the first instance unless indicated by the conditions found on exposing the dura. These meningeal signs at the early stage of an acute ear may mean nothing more than hyperæmia of the meninges, analogous to the hyperæmia and œdema we have already spoken of as explaining the early mastoid tenderness. Every otologist has operated on many cases in which the swelling and œdema behind the ear were such as to warrant the expectation of a subperiosteal abscess and yet incision revealed nothing more than a turgescence of the soft tissues to perhaps five or six times their normal thickness. The mastoid cells are opened and still no pus is seen—only a swelling of their mucosa. It is only when the antrum is reached that a small amount of pus under pressure is encountered. All this superficial œdema as I have already indicated, is as yet innocent of infection, and is merely the determination of nature's protective forces to the vicinity of the pus in an attempt to limit the invasion. Now if all this œdema is evident on the hither side of the pus-containing antrum

can we be surprised if occasionally we find signs of a similar congestion on the other side of the thin dural plate which separates the antrum from the meninges of the middle fossa.

Because of the possibility of the early meningeal signs being evidence only of such innocent œdema I think that the wise procedure is to do a complete mastoidectomy, exposing the dura of both fossæ freely to make sure that no extradural collection of pus is present, but avoiding in the first instance any attempt to drain the *pia arachnoid* space. If the condition has been one of simple hyperæmia the symptoms will be enormously improved next day—if not then drainage of the meninges must be attempted. Professor Holger Mygind of Copenhagen expressed the same view four years ago at the Glasgow meeting of the British Medical Association in a paper entitled "Benign forms of meningitis".

Time will not allow of my speaking about the other intracranial complications which may have to be dealt with. The purpose of this address is to present some rules of well-timed treatment which will by the avoidance of delay reduce such complications to a minimum. But an unusual virulence of infection or an insidious onset, or procrastination on the part of the patient may lead to a meningitis, or brain abscess, or sinus thrombosis even when our treatment is beyond reproach. We must be always alert for any unusual symptoms and exact in the detail of our examination not only at the beginning but from day to day till convalescence is established.

Before concluding however, I would beg your indulgence while I refer to another aspect of the question and one which is possibly the most important of all although more difficult to arouse enthusiasm for. In the cases we have been discussing the anxiety attending the acute symptoms and their immediate complications has been with us all the time, making decision on our part and acquiescence on the part of the patient easy. But there is a very common type of case which is apt to be mishandled just because of the absence of urgent symptoms. Paracentesis or spontaneous rupture has led to resolution of all the acute symptoms but the discharge still continues. To this class also belongs those numerous cases which come to our consulting rooms for the first time with a complaint

of ear discharge and deafness following on a short period of earache for which no advice was sought. The problem here is the conservation of hearing and the prevention of the passage of the case into the category of chronic otorrhœa with the dangers incidental thereto. If adenoids have not been attended to, or in the case of adults, any septic or obstructive condition in the nose, this should be done without delay.

One has seen scores of cases in which removal of adenoids has led to drying up, in a few days, of an ear discharge which has resisted local applications of all kinds for many weeks or months.

When the nose and nasopharynx have been cleared and still a discharge persists, most otologists now hold that it should not be allowed to continue beyond four or six weeks from its onset. It is to be presumed that the discharge is being maintained by suppuration in the antrum or aditus and that the ossicles in the middle ear are being subjected to such a prolonged bathing in pus that the possibility of

their recovery of function becomes more and more doubtful. Early drainage of the mastoid antrum is likely to be followed by complete recovery of the middle ear with restoration of normal hearing, whereas if mastoid operation is longer delayed the radical operation is more likely to be required.

The presence of large numbers of chronic otorrhœies is a reproach to the profession and that reproach can only be removed by some such systematic treatment of the acute phase which precedes the chronic.

To sum up.—Early paracentesis should be given a trial in most cases of acute ear: if any acute signs remain after thirty-six or forty-eight hours in the form of pain, tenderness or temperature, a mastoid operation should be undertaken, and it should be a complete mastoidectomy. If paracentesis leads to complete resolution of the acute signs but a discharge persists, mastoid operation should be done after four or six weeks for the conservation of hearing and to avoid the passage of the case into the class of chronic otorrhœa.

Acetanilid.—Investigations on the dangers of poisoning with aniline, to which reference was recently made in the journal, have served to correct certain current impressions regarding the toxicology of this substance, which occasionally is an industrial menace. Aniline has a direct toxic effect on the heart muscle, including the specialized conductive tissue; and in certain dosages it produces various types of arrhythmia and heart block. Contrary to the customary statements, methemoglobin does not seem to be formed during aniline poisoning. Death from acute intoxication is usually cardiac, not respiratory, in origin. This widely used drug is a derivative of aniline, mono-acetyl aniline, resulting from the introduction of an acetyl radical into the molecule. Young and Wilson, working at the Universities of Michigan and Wisconsin, respectively, point out that the use of acetanilid, acetphenetidin and other aniline derivatives may bring about symptoms similar to those of aniline poisoning. For acetanilid they have already shown that, like the mother substance aniline, it

also fails to produce methemoglobin despite the allegations of a positive sort in the medical literature. The action of acetanilid on the heart, blood and circulation is essentially the same as that of aniline. Both form para-aminophenol in the body, and this may account in part for the cyanosis sometimes observed. Prolonged administration of sublethal doses of acetanilid also produces anæmia and emaciation. Thus the widely used drug cannot conceal its intimate relationship to aniline. Indeed, the hypothesis has been ventured that acetanilid is hydrolyzed within the organism to form aniline and acetic acid or some derivative.—*Jour. Am. Med. Ass.*, July 10, 1926.

Dr. Oskar Klotz, professor of pathology and bacteriology in the University of Toronto, delivered the Gordon Bell Memorial Lecture, Winnipeg, on April 9. Dr. Klotz sails on May 1, for Lagos, West Africa, where, at the request of the Rockefeller Foundation, he will investigate yellow fever for six months.

MALIGNANT GROWTHS OF THE LOWER URINARY TRACT

BY DAVID W. MacKENZIE, M.D.

Department of Urology, Royal Victoria Hospital, Montreal

THERE is probably no medical question which to day is more widely discussed than the question of cancer; there is no medical problem for which a solution is more earnestly sought; nor is there a subject of study in our profession in which the general public is more vitally interested. In the treatment of this malady during the past few years, there have been successes and failures; there has been praise, and there have been reeriminations. We approach the subject therefore with caution. But we must remember that in our honest effort we are breaking relatively new ground, and that a scientific approach to the whole subject is only of recent years.

The object of this communication is not to lay claim to any successful plan for diagnosis, operative treatment, or prognosis, in the care of neoplasms of the lower urinary tract but merely to present some difficulties I have met with in the care of such cases. The different types of treatment have already been advanced by Beer, Squier, Young and others. At the last meeting of the Association of the Genito-Urinary Surgeons, I tried to present in a rather disconnected manner the various methods of treatment of bladder tumours employed in our service at the Royal Victoria Hospital, and to tell of our results up to that date.

The most important group of bladder growths are the epithelial tumours. They are derived from epithelium of one or the other kind, surface or glandular; from the surface epithelium or epithelial nests, or aberrant prostatic germs, as adenoma-fibromata or adenomata. These are generally known as papillomata and papillary carcinomata, better designated as papillary epitheliomata, and as papillary carcinomata; for any tumour may be papillary, whereas the decisive point for the designation is the histological composition of the tumours, and this is fibro-epithelial in character.

Probably, a larger number of bladder cancers than supposed are extensions from the prostate.

It is to these growths, including the more frankly prostatic ones, that I wish particularly to refer later. Kaufmann states that eighteen out of twenty-seven prostatic cancers, examined by him, had extended into the bladder, with preference for the posterior wall.

The surface epithelial tumours of the bladder are often divided into benign and malignant papillomata. Perhaps the commonest suggestive signs of malignancy are:

1. Induration.
2. Slough; true necrosis or a partial coating with greyish exudate.
3. Resistance to fulguration.
4. Single tumour; multiplicity often suggests benign tumours.
5. Age of patient; tumours in the older patients are more probably malignant.

There are many classifications, all in the main alike. Perhaps the simplest is that suggested by Christeller as:

1. *Typical papillary fibro-epitheliomata (benign)*: The most important sign of these is that the epithelial proliferations remain restricted to the mucosa, and are thus directed only towards the interior of the bladder. There is no tendency to grow into the deeper tissues, and these tumours are therefore displaceable on their base.

2. *Typical papillary fibro-epitheliomata (malignant)*: These tumours although they present certain histological irregularities in the pigment and basement membrane, are without the most important signs of malignancy in the form of destructive growth. They nowhere penetrate into the submucosa or muscularis, nor do they give rise to metastases, and are often reported as benign undergoing malignant change.

3. *Papillary carcinomata*.—These tumours are often characterized by a destructive deep growth into the muscular layer. The superficial papillary structure, closely resembling fibro-epithelium, is deeply alveolar, as in all other carcinomata. The histological diagnostic examination fully reveals the existence of typical

cancer cells, and destructive growth in the second and third stage, so that the diagnosis of malignancy can be positively rendered. The diagnosis of benignity in these cases affords information only of a segment of the tumour examined and not of the growth as a whole.

4. *Solid cancers*.—Histologically in part solid cellular medullary cancers, in part scirrhous or alveolar types.

In the literature of the subject the inoperability of a large proportion of cases of bladder tumours, is very rightly attributed to the length of time which elapses between the first symptom and the operation. The cystoscope has made the diagnosis of the presence of bladder tumours so easy that there is absolutely no excuse for such long untreated histories. The history in our cases varied from two weeks to thirty years.

It is not the absence of symptoms that causes havoc but the failure to appreciate symptoms. Blood in the urine is never physiological; it is a symptom of a pathological condition which should at once be investigated.

An analysis of 821 hæmaturias in our clinic showed that 192 were due to calculi, 113 to tumours, 88 to tuberculosis, and 143 to surgical infections of the kidneys, or, excluding the urethra, 536 cases out of 761, that is 70 per cent, were caused by calculi, tuberculosis, tumours and surgical infections of the kidney. The findings of Kretschmer and others give practically the same proportion.

The great diversity of results in the treatment of bladder tumours may be due, in part at least, to the nature, extent, and location of the growth, and the type and efficiency of the treatment used. For example: a tumour of the vault of the bladder is altogether different from a growth surrounding the vesical neck, regardless of its extent, its type, or the method of treatment.

Our list to date includes 258 cases: 118 benign, and 140 malignant. Hæmaturia was the chief complaint in 75 per cent of our cases; frequency of urination as the chief complaint in 25 per cent, and was associated in 60 per cent. Two cases with growth at ureteral orifice were admitted with rather typical renal colic.

In the early stages carcinoma is a local disease. The rational treatment, theoretically, at least, is complete and radical excision. In the bladder the disease often remains local for a

long period. Every effort therefore should be made to bring these patients early for examination, so that we may get rid of the local involvement before it becomes a general condition.

In our series we had many types and degrees of growths, and as many different modes of attempts at treatment, including fulguration, cautery, radium, excision, coagulation and deep x-ray, with many combinations of two or more of these. In the treatment by high frequency currents, the bipolar method was used entirely. The response in some fibro-epitheliomata was very striking. I do not believe that high frequency is of any use in carcinomata, except perhaps as a hæmostatic, nor have I found it satisfactory in multiple advanced fibro-epitheliomatosis or tumours about the vesical neck. In cases of very extensive papillomata of the bladder the cautery, through suprapubic incision, gives very satisfactory results.

In removing bladder tumours radically by the suprapubic route, the operator must remember the property of epithelium cells to grow on denuded surfaces. Therefore we must develop a method which prevents implants; we must destroy or excise the tumour in position, sponge as little as possible, and protect abraded surfaces from implants. In the surgical technique for the removal of bladder tumours, we have used for some years the method favoured by Beer, Squier and others, namely the extraperitoneal liberation of the bladder, thus permitting the drawing of the organ well out of its peritoneal and prevesical coverings, so that it is about two-thirds outside the abdominal wall.

Briefly the technique is as follows: The bladder is irrigated gently with warm borie or salt solution, and the patient is put in the Trendelenberg position. A free median suprapubic incision is made to the bladder, which is not opened at present. The peritoneal fold is carefully separated; the urachus is liberated, clamped, cut and the upper stump ligated. The lower stump is used to draw the bladder towards the symphysis, while the operator separates the peritoneum from the posterior wall of the bladder. The bladder is now well through the wound, and the abdominal wall is well protected with gauze. The bladder is opened almost anywhere, depending on the location of

growth or growths; and with the electric cautery the tumours are destroyed in situ, with as little manipulation and sponging as possible. If the case is one of benign papillomatosis, complete destruction with cautery well into the bladder wall is sufficient. If, however, the cystoscopic and microscopic examination, and palpation at the operation, suggest malignancy, the underlying bladder wall must be widely excised. If the tumour involves a ureteral orifice, it is best to excise the tumour and about two centimeters of the ureter. The ureter is re-anastomosed with the bladder by puncturing a healthy part of the bladder wall, and drawing the ureter through for about one centimeter, after splitting it into two lips and attaching it by catgut suture to the bladder.

The incision in the bladder wall, and in extension cases, the inside of the bladder, are swabbed with carbolic acid, and the wound and bladder are filled with alcohol for three minutes with the object of coagulating any viable tumour cells which may exist. The table is now returned to horizontal position. The wound is closed with a suprapubic tube to the bladder, and an extravesical cigarette drain is placed along the operation incision in the bladder, and through the suprapubic wound.

In the radium treatment, emanation seeds were used and inserted through a hollow needle. When deep x-ray treatments were given they consisted of a series of four treatments of 200 kilovolts, 5 milliamperes, sixteen inches distance, and exposure for sixty minutes. The rays are filtered through one millimeter of copper, and one millimeter of aluminium. One exposure is given over the symphysis; one over the sacrum; one over the right and left sacro-iliac joints. This repeated at the end of six weeks.

Now we approach the more uncertain area about the vesical neck, the frank prostatic tumours, and the more questionable associated growths of the trigone and posterior wall of the bladder. I think many of you will agree with me, that we have, each and all of us, met here, agreeable and disagreeable surprises.

Several years ago a colleague told me that he had operated on a class-mate for what he supposed was prostatism. Enucleation was extremely difficult, and when the specimen was removed, the surgeon was shocked to find the posterior lobe and seminal vesicles adherent to

the mass, and with nothing separating the operating finger from the rectal cavity but the wall of the bowel. The specimen was reported as carcinoma. The patient made an uneventful recovery, joined the Canadian forces at the beginning of the War; served four years in Europe, and returned in splendid health. Many others including myself have had similar experiences. We remove what proves microscopically a distinctly malignant growth, and yet the patient fares much better than the microscopical picture led us to hope, and better than our operation justified.

This non-malignancy, I mean local character and lack of generalization of microscopical cancers, though perhaps more common in the prostate, is seen quite commonly in the breast, and less commonly in other parts of the body. In Chipman's very interesting case of a typical cancerous ovarian, gelatinous, cyst adenoma, there occurred repeated regressions and recurrences of secondary tumour transplantations over the whole peritoneum, so that the peritoneum became again temporarily clean, as demonstrated by several operations. The patient ultimately developed a permanent recurrence and passed from sight. At the first operation a definite ovarian growth with numerous metastases scattered over the peritoneal cavity; at the second operation, about a year later, no secondary growths could be found; several years later an operation showed a few smaller growths. Can we call this a temporary immunity?

Oertel showed me an advanced carcinoma of the stomach, adherent to the spleen and liver with absolutely no metastases found, the patient having died of starvation. Did he have an immunity or did he lack the power to provide stroma and vasculature for the cells from his growth, that found their way into his circulation?

What is cancer? "An apparently lawless, destructive and therefore infiltrative, more or less rapid overgrowth by cells, which are derived from epithelium of one or the other kind, surface or glandular, and which by virtue of these attributes, may also generalize and produce metastases," Oertel (*Saskatchewan Med. Assoc. Report*, 1923), adds as definite requirements for growth: a stroma and blood supply. Most investigators to-day admit a more or less specific type of cancer cells, distinguished by

size and shape, staining qualities, etc. But the cancer cell is only one part of the cancer problem. The stroma and vasculature of the tumour are derived from the locality where the cell settles. This is true of original growth, of metastases, and experimental tumour transplants. The stroma or vasculature never metastasize or are never transplantable. They are the local response of the host to the invasion of the cell.

The prostate like other organs of the body undergoes with advancing age a type of decline or retrogression. It is well established, paradoxical though it may sound, that this structural and functional decline and loss is associated with proliferation of retrogressing cells, evident in the parenchyma, as well as in the stroma. This is part of a true physiological retrogression, and not a prostatitis as formerly supposed. Hyperplasia in a retrogressing organ, with hyperplasia of retrogressing cells, is really the evidence of a physiological decadence of a living substance. Anyone who will follow his prostatic specimens must be impressed by the frequent appearance of curious and quite abnormal cell hyperplasias in parenchymatous cells, which go far beyond simple proliferation or regenerative attempts. These occur within circumscribed areas, and affect principally those cells which line glandular ducts. These cells change their characters; they are less differentiated, but show atypical shapes and changes in nucleus and plasma. They also often show very excessive hyperplasia. The old atrophic lining cells are replaced by new cells, which proliferate quite freely into the dilated duct lumen, and also beyond the duct limitations. These restless atypical nests are seen along with otherwise typical glandular hyperplasia, and resemble in various degrees the microscopical picture of cancer. These conditions have often been referred to as "precancerous" stages. However, the same pictures have been produced artificially in animals by local applications (Yamagiwa and Iehikawa), and in experimental tissue cultures (Maximow). These artificially produced pictures may go on to the formation of true genuine cancers; they may remain through the normal life of the animal, or they may entirely disappear with time. Borst suggests the term "carcinoid" as better than precancerous.

In comparing these two types of epithelial

growths, the natural retrogressive found in the prostate of advanced years, and the artificially produced, there is a distinct similarity, so that both may be taken as carcinoid tissue changes. It is surprising how frequently these areas are found if you make a thorough search for them. Many are diagnosed as cancers, early cancers, and precancerous conditions. They are potentially cancers, but they do not always develop into true cancers with metastases.

Quoting Oertel: "Here is, to my mind, the crucial question of the cancer problem. The cancer cell does not alone contain the secret of cancer growth. I would go further and say that the more I see of the retrogressive and progressive cell and tissue changes, which are constantly proceeding in the higher organs, and which assume greater prominence with advancing age, the more I am inclined to believe that in the majority of us potentially cancerous and other tumour cells exist some time during life. But, as in infections, only a number of us, unfortunately too great a number, enter into relation with these new cell races by offering them those accommodations which allow them to live and grow on us. For the tumour growth requires, besides the cancer cells, another essential factor, that is the response of the host to furnish stroma and vasculature to permit the cells to organize and grow. Should the response fail the lesion remains carcinoid or disappears eventually."

Now what bearing has this on the treatment of prostatic growths? Would many of these growths remain local, if never treated? Recurrence following radical surgical treatment of cancer of prostate is not so common; considering our operative technique, it is not as common as we expect it to be. Are these true cancers, or only carcinoid? Or are our results due to an immunity on the part of the patient, or a failure on the part of the patient to furnish stroma and vasculature for transplants? In our service we have tried a sufficient number of methods in the treatment of clinically diagnosed cancers of the trigone and prostate to show definitely how uncertain the results are in our hands. I do not feel that we often cure cancers; that is, prevent generalization and metastases; we have removed a local condition; it is questionable whether we have prevented generalization.

Most of these growths are associated with retention of urine and prostatism, and require

surgical interference to relieve their retention. In some advanced cases, we have, under local anaesthesia, only inserted a suprapubic drain; in others we have removed the obstructing part suprapubically with many poor, and some good results; in some we have inserted radium seeds through a suprapubic wound; in others, through the perineum; in a few a crude suprapubic partial removal, followed by the use of radium, and later x-ray treatments; and finally, and I think the best method, we have employed Young's radical peritoneal prostatectomy. I am far from claiming that this form of treatment can be guaranteed to get beyond all parts of the

growths but its high percentage of successes seems to me to confirm definitely Oertel's suggestion that many patients with these growths have an immunity or they lack the essential elements to provide a suitable seeding ground.

BIBLIOGRAPHY

- (1) KAUFMANN, *Spezielle Pathologische Anatomie*, 1922, 1127. (2) REER, EDWIN, *Am. Surg.*, 1921, lxxiii, 72. (3) CHRISTELLER, *Ztschr. Urol.*, 1925, xlx, 103. (4) MACKENZIE, *Surg., Gyn. & Obst.*, 1924, xxxlx, 155. (5) OERTEL, *Saskatchewan Med. Assoc. Report*, 1923. (6) YAMAGIWA, K., Ein kleiner Rückblick auf unseren Künstlichen Tierkrebs Gann, *Japanese Journal of Cancer Research*, 1924, xviii. (7) MAXIMOW, A., Über krebsähnliche Verwandlungen der Milchdrüse in Gewebekulturen *Virchow's Archiv.*, 1925, 256, 3, 813.

CRANIAL AND INTRACRANIAL INJURIES*

BY CHARLES K. P. HENRY

Attending Surgeon to the Montreal General Hospital

THE observations made over a period of five years on 200 cases of cranial and intracranial injuries admitted to "L" surgical service in the Montreal General Hospital form the basis of this article. Of these 200 cases 44 were operated upon with 10 deaths: a mortality of 22.7 per cent. Of those not operated upon 28 died, a mortality of 17.9 per cent. The total mortality in the 200 cases was 19 per cent.

A continuous service made it possible for the writer to follow all cases of skull injury, and this experience has been supplemented by consistent co-operation between the neurologist, Dr. F. H. MacKay, and the ophthalmological department of the hospital. All public cases in the service of Dr. Eberts are included, and also various private cases belonging to the members of the "L" surgical service. By means of this

co-operation we were able to initiate a systematic method of examination, to control the treatment, and to record all the signs and symptoms, interpret these, and confirm or disprove our conclusions at the time of operation, and in a few cases at autopsy. Unfortunately, the autopsies were mostly Coroner's court cases, in some of which we have failed to get any report. Drs. MacTaggart and Derome, however, have been most courteous, and have accorded us opportunities of being present at some of the autopsies, and have furnished records of their findings at others.

The large increase in the number of cases of cranial injuries admitted to the Montreal General Hospital in the last few years has been due chiefly to the increased use of motor driven vehicles in the city streets. Another increase is due to the rapid growth of Canada's largest port; the majority of our head cases are admitted during the summer months.

Many cases, however, are not treated in our large hospitals, and, from time to time, cases have been seen in consultation in private homes, where careful examination, and the use of the spinal manometer made it unnecessary to re-

* This article is based on a paper delivered before the Montreal Medico-Chirurgical Society on February 15, 1924. When the paper was presented about thirty-six lantern slides were exhibited; hardly a clinical case was referred to in which x-rays were not available and were shown. In this article an attempt has been made to cut down to a minimum illustrative cases, and to present a picture composed of the clinical signs, neurological findings, x-ray results and the treatment, operative and otherwise, illustrative of the results in several hundred cases of fracture of the skull and intracranial lesions which may be of value to others.

move them to hospital. The recognition, the treatment, and the after care of such cases must often devolve on practitioners, not hospital attending surgeons.

The diagnosis of a fractured skull, and of a suspected intracranial injury, is not always clear; injury may precede and be the cause of intracranial vascular lesions on which the symptoms may present a so-called "medical" aspect rather than that of a surgical lesion. The following is an example:

Mrs. J. W., case No. 6056, 1922, aged 71 years. Was admitted by train twelve hours after a fall on a sidewalk on which she struck the back of her head. She arose unaided and walked several blocks to a doctor's office. There she complained of severe occipital headache; vomited twice within half an hour, and within forty-five minutes of the accident lapsed into unconsciousness, with flaccid paralysis. Stertor and Cheyne-Stokes respiration were noted shortly afterwards, with incontinence of urine and faeces. Pupils were unequal; the left was contracted. On admission there was muscular tonicidity of all four extremities, more marked on the left side. Her blood pressure was over 200 systolic. There was paresis of left side of face; and a double Babinski was present, and an Oppenheim. Rectal temperature was 104°. A lumbar puncture gave blood stained fluid, pressure 10 mm. Hg. Fundi showed slight cupping of right disc, sclerotic arteries and areas of old degeneration. The peripheral arteries were sclerosed, and the urine was that of a chronic nephritis of an infective nature; casts, albumen, pus cells and bacteria were present. The heart was enlarged, the aortic second

sound was slightly accentuated. The trauma and the onset of severe headache shortly afterwards with rapid coma indicated intracranial hæmorrhage, but the bilateral Babinski and generalized tonicidity (as well as the high temperature) suggested *intracerebral* hæmorrhage. Several spinal punctures showed no increase in pressure. She died just two weeks after onset of attack; the terminal temperature was 105.4°. The blood pressure fell to 150-160 on the evening of admission and remained there throughout. The autopsy revealed some cortical hæmorrhage on the left cerebrum; the midbrain showed a fresh cerebral hæmorrhage, an aneurysm on the internal carotid artery with excavation of the optic nerve. Autopsy No. 223, 1922.

Even minor falls and other injuries may and do produce temporary unconsciousness, with deferred symptoms, which if unrecognized by the attendant may later be found to be the syndrome of extra dural meningeal hæmorrhage, which every medical man should recognize.

E. L., case No. 6701, 1923, male; admitted December 24, 1923, was discharged January 14, 1924. A limb of a tree had fallen on the right frontal area eleven days prior to admission, while working as a lumberman; he was slightly stunned but never unconscious. There was a scalp wound, and a gross depressed fracture was palpable. He had had nasal hæmorrhage; and came in with extensive sacral bed sores, in a wretched condition from lack of care. He was mentally clear, but slow to answer questions; was quiet and had always been rational. No history of incontinence was elicited, though this occurred in ward. There were no abnormal findings, save a definite left motor paresis of the face and of the third and fourth right cranial nerves. There was no Babinski. Two days after admission, after he was cleaned up and prepared, operation under $\frac{1}{4}$ grain of morphia hypodermically and local anæsthesia was easily done. Towards its close he was sleeping peacefully. There was gross hæmorrhage between the flap and the bone which was severely comminuted and depressed over a considerable area, in true shelving gutter style. The fragments were elevated, and some loose ones removed. There was fully a cupful of black, currant-like clot be-

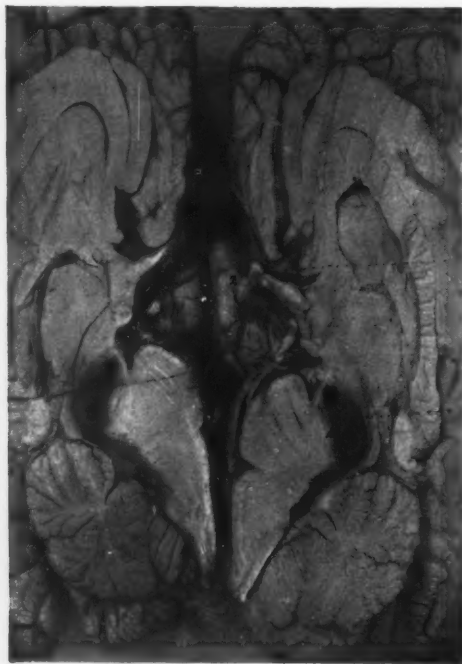


FIG. 1.—(1) Blood clot in midbrain. (2) Aneurysm of internal carotid artery, with excavation of optic nerve.



FIG. 2—Large depressed fracture with multiple lines of comminution.

CASES OF CRANIAL INJURY

General Physical Examination.—By the Resident.

Lumbar Puncture with Spinal manometer.—By the Resident.

Blood Pressure.—Taken by and urinalysis is made by the Resident.

Blood Biochemical.—By Dr. Rabinovitch.

Fundus and Refraction.—By Dr. McKee.

Neurological.—By Dr. MacKay.

X-Ray } By Dr. Ritchie.

Photograph }
Nose, Throat and Ear.—By Dr. Hamilton.

Name	Date of admission	Sex	Age
	a.m. p.m.	Discharge well died	
Trauma	Date	Hour a.m. p.m.	Admitted by:— Ambulatory Vehicle Ambulance
Shock	Unconsciousness	Duration	Onset
Slight	Primary, slight		sudden
Profound	deep		
Duration	Lucid period	Duration	onset
	Secondary	Time	gradual
	slight		sudden
	deep		
	coma		
Restlessness	Irritability	Delirium	Cheyne-Stokes respn.
Signs of trauma		Stertor	
Scalp wound, lacerated	single	frontal	Right
contused	multiple	parietal	Left
		occipital	
Hæmorrhage			
external wound	free	slight	Headache
subconjunctival	right	left	Vomiting
auditory	right	left	Vertigo
nasal	right	left	
suboccipital	right	left	
pharyngeal	right	left	
hamatoma	site		Convulsions
ecchymosis			
Cerebrospinal fluid		auditory canal	right
escape		nares	left
scant	free	pharyngeal	
Lumbar puncture		blood	purulent
clear	turbid		pressure
Paralysis			
generalized	right	left	motor
local, face	right	left	motor
arm	right	left	motor
leg	right	left	motor
tongue	right		
X-Ray report			
Cranial nerves	paralysis 1	2	3
	Paresis	4	5
	right or left	6	7
	Size	8	9
	pupils, light	10	11
	accommodation	12	
Pupils	Equality	Shape	
Reflexes	right	left	
supraorbital	right	left	
mandibular	right	left	
abdominal	right	left	
cremasteric	right	left	
patellar	right	left	
tendon Achilles	right	left	
triceps	right	left	
supinator Longus	right	left	
extensors	right	left	
plantar, flexion	right	left	
extension			
ankle clonus	right	left	
Oppenheim	right	left	
Kernig	right	left	
Leri	right	left	
bulbo cavernosis			
Organic. Urine; incontinence			
retention			
Fæces; Incontinence			
Operative findings; Skull, fracture			
linear			
depressed			
compound			
Hæmorrhage Meningeal	subdural	site	
subpial			
Brain—normal appearance		pulsation	
pale		undertension	
discoloured		hernia	
lacerated			
depressed			
Foreign body—subdural	intracerebral	site	
Pus	intracerebral	site	
Treatment—Decompression	site		
bone removed	amount	replaced	
dura opened	sutured		
brain explored	variety	site	
drain			
CONVALESCENCE	INFECTION	RESIDUAL SYMPTOMS	
Remarks:—			

tween the frontal and parietal bones and the dura, and anteriorly this was fully one and a half inches from the proper bone level. On opening the dura posteriorly there was a pale, flattened, non-pulsating brain beneath; there was escape of brain tissue anteriorly. He was markedly improved mentally within two hours, and quickly became bright and talkative. He had no febrile reaction. Nineteen days after operation he walked out well save for slight ptosis and slight weakness of right superior rectus and superior oblique muscles of right eye. He showed a slight right papillo-edema.

The routine of examination and the method of recording of the symptoms and signs is shown by the form shown on page 915, which are now in use and which have been gradually evolved during the work.

Such a method of examination has enabled us as a rule to decide

(a) Whether there is a cranial or intracranial lesion,

(b) Whether the patient has a mild, moderately severe, or severe lesion, and

(c) Whether operative procedures are necessary or not.

Our cases naturally fall into several distinct groups. (1) *There are those with scalp injuries, with or without underlying bone injury.* These are treated by shaving the hair for a varying distance adjacent to the wounds, swabbing with iodine, and examining or probing for linear or depressed fracture. In no case is soap or water used on the wound, and the wound is protected by a swab of iodine while shaving and cleansing the periphery with ether and alcohol. If no fracture is made out the scalp is sutured, with or without excision of the edges, and no drain is left in. If a fracture is made out, or suspected, the wound is iodined and a dry dressing and bandage applied. Hemorrhage is controlled and, when operation is to follow, forceps may be left on the flap temporarily. No cases are rushed to the operating room on admission, and only those cases are treated by immediate operation for scalp repair where it appears that there is no fracture or intracranial injury. A case admitted immediately following injury has yet to be seen where immediate operation was necessitated because of fracture of the skull or intracranial injury. Even depressed fractures do not have to be rushed, and in fact a large majority of depressed fractures cause less anxiety than many without proven fractures. Initial shock is often quite marked, and an operation done early would seem as strongly contra-indicated as during shock from

other conditions. We treat shock by heat to the body and a rectal shock enema of hot saline, six or eight ounces with one or two drachms of brandy, and if there is much pain or restlessness a hypodermic of morphia is given. Hemorrhage is, of course, controlled.

(2) *Cases with or without scalp injuries, with simple linear or stellate fractures of the vault without depression.* The scalp injury is treated as recorded above, and the bone fracture is disregarded, unless there is evidence of intracranial injury, or the fracture line contains foreign material, when it may be chiseled. If an intracranial injury is complicating the picture this is treated by operation later on when necessary. The following is an illustrative case:

Emile H., case No. 3851, 1923, aged 29 years; admitted July 20th and discharged August 22nd. He fell four feet striking right side of head, and there was deep unconsciousness for half an hour. He showed a right parietal scalp wound; fracture of right temporal and frontal bones, crossing over midline, and paresis third, fourth and seventh right cranial nerves. There was incontinence of urine for fourteen days. He showed a bilateral Babinski; and was irritable and restless. Seven days after his injury, because of non-improvement, a subtemporal decompression was done on the right side. When the dura was opened fluid shot up several inches; the brain was found lacerated in the middle fossa and a blood clot there was removed. His recovery was uneventful and complete.



FIG. 3.—Coronal fracture and horizontal fracture and decompression areas.

Operation alone will be of service when an excess of cerebrospinal fluid has for days been producing cerebral pressure. Operation for middle meningeal hemorrhage is indicated always.

George G., case No. 714, 1923, aged 37 years, was admitted February 7th, and discharged February 26th. He was suffering from trauma occasioned by a fall. On the day of admission a lumbar puncture gave blood stained fluid, pressure 15 mm. Hg.; on the following

day the pressure was 10 mm. of mercury. He was unconscious for three days, was restless and irritable and had a right auditory hemorrhage, but no paralysis. Antero-posteriorly the vertex showed a long fracture. On February 10th a right subtemporal decompression was done, and the brain was found compressed by excessive fluid. On his return from the operating room he spoke and recognized his father; and took some nourishment, though he had had none prior to operation. There were no residual symptoms.

Buffioni F., case No. 2911, 1923, aged 35 years, was admitted June 5th and discharged June 22nd. His admission was twenty-four hours after injury, which was due to a barrel falling on his head. He was not rendered unconscious by this, but fed and took care of his horses, went home to bed, went to sleep and regained his memory on June 8. On admission to hospital deep unconsciousness was present for three days. A lumbar puncture gave blood stained fluid, pressure 45 mm. Hg. Examination showed a right occipital scalp wound, pupils unequal and sluggish; tonic contraction of right hand and local signs of injury right side of head. He was restless, irritable, constantly muttering; and had retention of urine. A right subtemporal decompression was done on the day of admission, when a transverse fracture was found beneath the temporal muscle, and a large blood clot between bone and dura, due to rupture of one of the branches of the middle meningeal, the main trunk of which was still pulsating. On opening the dura there was red currant jelly-like material beneath, and an immense quantity of bloody cerebrospinal fluid shot up one and a half inches above the dura; more than two and a half ounces came away. The brain was lacerated and discoloured and there were pial hemorrhages. Some depressed bone was embedded in the brain. At the beginning of operation his pulse was 42, on escape of fluid it rose to 100 and remained constant. His recovery was prompt and there were no residual symptoms.

The amount of brain damage and the neurological symptoms are not always relative; the latter are at times surprisingly slight. The history of the following case is illustrative:

Kathleen D., case No. 3331, 1923, aged 6 years, was admitted June 25th and discharged July 19th. She was injured by an automobile, with temporary unconsciousness. There was present a linear fracture with depression of left frontal and occipital bones and a fracture of left parietal; the clavicle was broken. She was restless and irritable, due, however, more to her multiple injuries, rather than to her cerebral irritation. Her nose was fractured and there was escape of cerebrospinal fluid from it. A lumbar puncture gave blood stained fluid. Three days after her admission a left subtemporal decompression was done. The nasal fractures were reduced by Dr. Wright. On incising the left temporal muscle fascia brain tissue was found to be expressed through the torn muscle, from a transverse fracture of the bone beneath, with separation of bone edges 1/16 inch with gross brain tissue exuding. Dura was opened in another place and considerable brownish fluid came away. The brain was lacerated for a considerable area, apparently in the area of the temporo-sphenoidal lobe. It was impossible to completely cover the brain by the dura. A rubber dam, which was later removed, was inserted over the brain. She was discharged with no residual symptoms.

(3) *Depressed fractures, simple or compound, always demand operation, save occasionally in infants, where even considerable bony depressions appear to elevate themselves unaided.*

Isabel McL., case No. 4448, 1923, aged 9 months, was admitted August 24th and discharged September 14th. She was injured by a fall downstairs, in her mother's arms, about seventeen hours before admission. There was slight shock, but no unconsciousness or paralysis. The skull showed flattening and depression of left side of vertex, oedema and a ridge over the parietal area. Lumbar puncture gave blood stained fluid, pressure 4 mm. of mercury. Her mother stated that she vomited several times and that blood was present. The depressed, flattened skull quickly came out, and the child left the hospital in three weeks well; she was detained for a week to correct feeding methods.

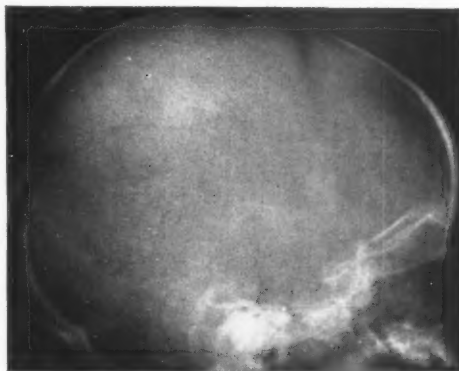


FIG. 4.—Fracture running horizontally from occiput.

Many of these depressed fractures show few, if any, cerebral changes and even no increased intracranial pressure is recorded by the manometer, and rarely no blood is found in the cerebrospinal fluid. The following is a case of a depressed fracture without demonstrable injury:

J. M., case No. 2938, 1921, aged 36 years, a pipe fitter who was struck at 11 a.m., July 8, 1921, by an iron bolt, which fell fifteen feet on to his skull in the right parieto-occipital region. He did not lose consciousness, was not dizzy, had no bleeding save from his scalp wound and had no neurological symptoms. There was pulsation at the site of the depression, which was about the size of a twenty-five cent piece. Lumbar puncture gave clear fluid and showed no increase of pressure. The following day operation was done under local anaesthesia and the depressed bone was elevated after excising the skin edges and removing dirt and hair. There was a small tear in the dura beneath, which had been sealed by the depressed bone, and on its removal cerebrospinal fluid freely escaped. He had a slight degree of osteomyelitis, with a small sequestrum which came away later.

Gross depressed fractures have been a frequent finding, and in them operation has usually produced brilliant results.

Marcelle G., case No. 2621, 1921, aged 4 years, was admitted on June 22, 1921, by ambulance, immediately after falling about twenty feet, from a second storey, on to cement pavement where she struck the left side of her head. When admitted she was in a condition of shock, her pulse was 108, she was semi-conscious, had flaccid paralysis of right half of body, head turned to

right; pupils active, the left sluggishly; slight left-sided spasticity; the reflexes corresponded, plus on left, decreased or absent on right. Lumber puncture gave blood stained fluid. There was a local scalp injury and a depressed fracture of left parietal region. Treatment for shock was given and operation postponed until 3.30 p.m. which was five hours after injury. Extensive fracture of left temporal, parietal and frontal bones and radiating fractures across mid line and down to base were found. The loose fragments were removed and depressed portions elevated. The dura was found torn and the brain contused and ecchymotic. Anaesthesia was light ether, and before leaving the table she moved her right hand, but no movement of leg was then obtained. She developed a suppurative otitis media right ear, but made a rapid and complete recovery, walking out of the hospital three weeks later. Her history has been followed for several years, and there has been no motor or mental impairment.

Occasionally large depressions with gross bone injury and intracranial lesions co-exist. An early operation is indicated and may restore the patient to health. Again gross injury or destruction to the cerebral cortex may be produced by the depressed fracture, and no recovery can be expected of functions controlled by this cortical area. The amount of cerebral and bone damage that is found sometimes is very extensive. The following is an example:

Antoine M., case No. 3429, 1922, aged 33 years, was admitted July 10, 1922 at 2.10 p.m. by ambulance, in a condition of shock. He received saline by rectum and was operated on three hours later. Following his injury, which was produced by a weight falling on his head causing a large left-sided scalp wound; he was conscious and rational. Examination revealed an extensive gutter fracture parallel to and three inches from the midline. There was bleeding from the left ear. He showed a complete right-sided hæmiplegia and paralysis of the left sixth and seventh cranial nerves with a right Babinski. The operation revealed a ditch five inches antero-posteriorly, two inches deep and two and a half

inches wide. Bone was removed to allow of elevation of the rest. The dura was found anteriorly to be one and a half inches from the proper level of the bone. Haemorrhage from cerebral vessels and from a sinus posteriorly was controlled by clips and packing. There was remarkably little laceration of the dura. Brain tissue oozed out posteriorly. Operation was rapid and his after condition good. Eleven days after the operation motor power began to return in the leg; and in six weeks the left sixth and seventh cranial nerves began to function again. He was clear mentally and his speech was good. He has not regained function in his arm, but walks well and has never had Jacksonian attacks.

In operating on these cases a local anaesthetic gives most satisfactory results, and the amount of work that can be done painlessly is surprising.

Peter S., case No. 5241, 1923, aged 24 years, was admitted October 5, 1923, and discharged October 24th. He had been beaten over the head, but walked into the hospital from the ambulance. He had only momentary unconsciousness and slight shock. Over the right parietal region he had a scalp wound, three inches long, with free bleeding, which was controlled. The next day, after receiving a hypodermic of morphia, grain $\frac{1}{4}$, the skin edges were excised under local anaesthesia, and a large comminuted and depressed fracture of the right parietal and occipital bones was disclosed. The bone was elevated and an extra-dural jelly-like clot removed. While doing this posteriorly the patient said that he could feel it in his eye, showing we were over the optic radiation in the occipital cortex. This was the only observation he made during the whole procedure. The dura had not been opened, and as there was good pulsation it was not opened. He made a rapid and complete convalescence.



FIG. 5.—Gross bone defect.



FIG. 6.—Gross bone depression in posterior fossa and area removed.

It is almost unbelievable that a depressed, comminuted fracture such as the following could be missed, or its importance not recognized, when first seen. Yet a case was admitted, following a kick by a horse six days before admission, only because he developed convulsions of the Jacksonian type.

Wilfred F., case No. 1841, 1923, aged 13 years, was admitted on April 9, 1923, from the country. He had a scalp wound one and a half inches long in the postparietal region on the right side. After his injury on April 3rd, there was primary unconsciousness for only two minutes, followed by a "convulsion" of the side of the face, and vomiting. These clonic contractions recurred five days later, becoming generalized convulsions without loss of consciousness. He walked into the hospital, mentally a little dull, dizzy and nauseated and with an unhealed, unsutured, bleeding wound. Lumbar puncture gave clear fluid, as in case No. 2938, under high pressure 30 to 38 mm. of mercury. The skin edges were excised and a horse shoe flap turned down. The skull appearance beneath may be visualized from the photograph of the fragments, which I have had mounted as they were found.



FIG. 7.—Bone fragments as elevated.

The dura was not torn though there was depression of the fragments and gross extra dural clots. On incising the dura considerable brownish fluid escaped; there was contusion and laceration of the brain beneath, and through the incision, a considerable quantity of intracerebral blood clot was promptly extruded. The opening was enlarged, and more was pressed out. There were no convulsions after the first twenty-four hours following the operation, and his recovery was uneventful. He was discharged well in twenty-three days. He was re-admitted May 28th for a small scalp infection, at old wound edge, which healed in eight days. His examination then revealed no neurological symptoms. This case was the only true case of Jacksonian epilepsy in our experience.

The compound fracture of a skull bone is treated as a compound fracture of a tibia, for example. The wound edges are excised, the contents of the wound, (hair, cap or dirt), are removed, and the portions of bone that are loose and separated from the pericranium are elevated; the torn dura is sutured at times or is left open for decompression and drainage. Haemorrhage from the scalp is easily controlled by

forceps on the aponeurosis, which are retracted and secured in clusters of four or six, by gauze ties. No scalp vessels are ligated; the sutures control them when the wound edges are closed. Haemorrhage from the dura or cerebral vessels is controlled by suture, usually of black silk, or by dural silver clips. The cerebral sinuses bleed profusely, but pressure readily controls this, and if necessary the application of a muscle pad graft and pressure for a few minutes may be used. Bone bleeding is readily controlled by Horsley's wax. Before opening the dura all bleeding should be stopped.

(4) *Cases of increased intracranial pressure, without gross fracture.* This is a much larger group of cases than the depressed fracture class. These patients are admitted conscious, semi-conscious or unconscious. There is no compound, depressed, or any kind of fracture made out clinically or by x-ray, or if a fracture is made out it is a linear one. They are often our most serious cases, and several have died in whom autopsy has revealed no bone lesion, and yet there has been gross intracranial haemorrhage, brain laceration or contusion. They all show serious mental symptoms, irritability, delirium, or mania, and require sedatives and restraint, and often watchmen. They have no focal signs, paresis or paralysis, no scalp lesions, and often cannot be x-rayed without a general anaesthetic, which is not safe. Many show temperature elevation, 100 to 102° or higher; usually they have incontinence of urine, and neurologically are classed as cases of *concussion*. The violent, irritable individual with several degrees of fever, bloody cerebrospinal fluid under pressure of 10 to 20 mm. Hg. or more, above normal, is frequently found to have cerebral contusion and laceration. *All these cases show alteration in the cerebrospinal fluid, which ranges from 10 to over 40 mm. of mercury, and from cloudy or pink to almost pure blood in appearance.* They are the cases that in some clinics are all treated by subtemporal decompression. In Boston a few years ago I heard Dr. Harvey Cushing urge this in all cases. We are doing fewer now than we did in 1916, 1917 and 1918. For the last three years I have attempted to arrive at some conclusion regarding the treatment of these cases and my present method is as follows: *in the absence of coma, focal signs or obvious fracture repeated spinal punctures are done.* The initial reading

is reduced slowly fifty per cent by the manometer tap, with the mercury scale still attached, but never below 8 mm. of mercury. The amount of cerebrospinal fluid necessarily withdrawn varies, averaging 8 to 10 c.c., often 15 to 20 c.c. and occasionally only 1 to 2 c.c. The puncture is always done in the horizontal position, with local novocain anaesthesia. Only two minor accidents have happened, a house surgeon broke two hypodermic needles injecting novocain in a restless patient, one of which I removed, leaving the other still there, though the patient knew it not; and I broke the manometer needle once; but easily cut down and removed it as local anaesthesia had been induced for the puncture. In the several hundred cases no untoward symptoms from the puncture have been observed. This is repeated in four, eight or twelve hours, and as often as deemed necessary to keep the pressure down to normal for several days. This should be repeated some days after a normal reading has been obtained, lest a secondary rise, due to cerebral oedema, may have occurred. In some cases six or more punctures have been done; many have shown immediate relief from headache, and restlessness and irritability have decreased, so that it is common to find the bedside notes report "patient much quieter since lumbar puncture", "headache is less", or "patient became conscious after lumbar puncture". Speech has been regained promptly in several cases after the first or second tapping. I have no hesitation in stating that operation has been done much less frequently since adopting this measure of intracranial decompression by the spinal route. When the reading remains high, 15 to 30 mm. of mercury or over, and the fluid clears up, often becoming limpid, one must have an in-

crease of intracranial pressure by blood clot which has become encysted, or the back communications to the spinal canal are closed. Such cases require operative decompression. In the following case repeated punctures failed to get any spinal fluid.

W. S. S., case No. 3808, 1921, aged 24 years, a fireman who fell off a wagon to the pavement, was admitted 11 a.m. August 24, 1921, by ambulance, two hours after injury. He was unconscious and a lumbar puncture gave blood stained spinal fluid, pressure 24 mm. of mercury. He was violent, requiring four people to hold him. There were no focal signs, no evidence of bone fracture, or bleeding from accessory cavities, nose, ears or throat. He had a transient right external squint, and ecchymosis back of the right ear. About twelve hours after injury a right subtemporal decompression was done, with only slight findings; some dark blood beneath the dura and the brain under tension. The following day he was quieter and able to answer questions, but his blood pressure was still 160 and 80. Spinal punctures were unsuccessful, and the x-rays were unsatisfactory. No focal signs developed, but his temperature rose to 110° before death, which occurred on the third day after injury. A decompression operation on the other side was discussed but in the absence of any right sided paresis or alteration in reflexes it was not done. *Autopsy, No. 184, 1921* showed (1) laceration of brain on the inferior surface of left cerebrum, (2) subtemporal hemorrhage in left anterior and middle fossa, (3) intradural hemorrhage in right posterior fossa but, (4) no fractures of the bones of the skull.

The case recorded above exemplifies the severe type *without* fracture but with initial temperature, violent type of delirium and absence of focal signs, and with gross cerebral contusion and laceration. These very restless, talkative, often violent cases, usually with temperature

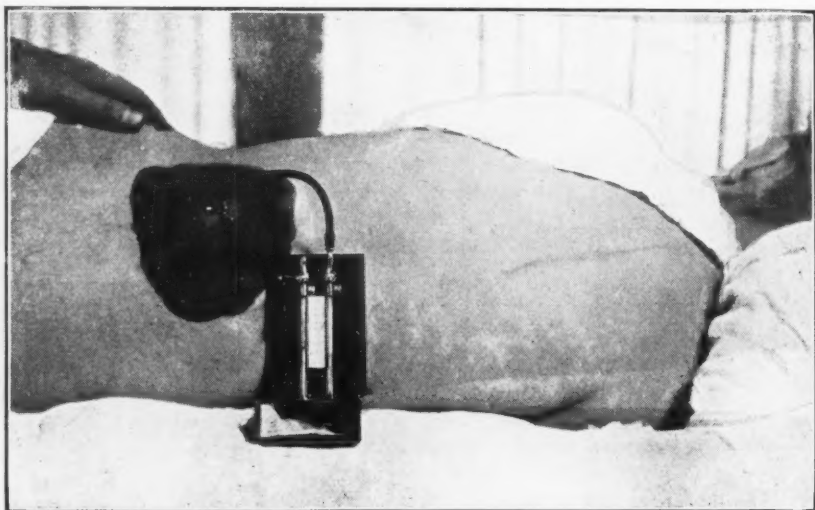


FIG. 8.—Landon's Mercury Manometer.

elevation, and sometimes with a Babinski or increase of all reflexes are serious cases; they show cortical hemorrhages and operation is to be seriously discussed, and should, I believe, often be done to save life and reason. Hemorrhage is often found over the temporal lobes or frontal region, and a middle fossa low decompression is indicated. The following is an illustrative case:

Napoleon P., case No. 1528, 1921, aged 44 years, was admitted April 13, 1921, thirty minutes after injury in a motor cycle accident. There was initial unconsciousness of one to two hours, a lucid period of one hour, deepening coma and stertor three hours after injury. Directly after the injury he had walked and talked. General signs of increased intracranial pressure were present clinically and by lumbar puncture. On the day of admission a right subtemporal decompression was done. The x-rays were negative for fracture. He recovered, and was discharged well seventeen days after his injury.

Many of these cases have *no skull fracture*, and sometimes *no sign of scalp contusion or laceration*, but may have gross intracerebral lesions. In this group we find cases requiring multiple operation, and at least four in our series have had bilateral operations; and in the earlier series there are three cases that I now believe should have had both sides operated upon. The following case illustrates this:

Douglas R., case No. B 5401, 1923, aged 8 years, was admitted October 15, 1923, two hours after he had been injured in a motor accident. Slight initial unconsciousness was followed by a lucid period of fifteen minutes, when he walked home, talked, and then vomited; this was then followed by deep unconsciousness. There was a contusion of the scalp over the right occipital region. Lumbar puncture gave bloody fluid. Epistaxis was noted, and there was twitching of the left arm, and leg, and of left side of face; there was also left nystagmus. This condition was followed by paresis of the left side. His blood pressure was elevated, being 128 and 55. Operation of right subtemporal decompression was done five hours after injury. On incising the dura bloody fluid was found,



FIG. 9.—Vertical and horizontal fractures and decompression areas.

under tension and in gross amount; there was gross hemorrhage over the cortex and in the bottom of the middle fossa. At first there was no brain pulsation, but it quickly appeared. The brain was contused and discoloured. He improved rapidly until 11 a.m. the next day, when he began to have almost constant twitching on the right side of the face and of the right hand. He had regained the motor power of the left side of the body. He was unable to speak and clonic convulsions were continuous. A right Babinski was present. Therefore fifteen hours after the first operation, a left sided decompression was done. On opening the dura there was scant fluid, the brain was edematous and under pressure, bulged into opening, and the dura edges did not nearly approximate. After operation he was restless and noisy, but became rational next day and regained motor power on the right side and his speech. The incisions healed per primum. Maximum temperature was 100.8° the day after the second operation. He was discharged November 1, fifteen days after the accident, quite normal mentally and physically.

Cranial nerve lesions are frequent, paralysis and paresis of the third, fourth, sixth, seventh and eighth cranial nerves are most often encountered. In several cases lesions of the seventh and eighth nerves were found in fractures through the petrous bone, and in three cases the occurrence of facial paralysis in an unconscious patient was noted. In two cases this was not thought to be recent because in one there was the scar of a mastoid operation, and in the other a pre-aural scar, and in both, the eye on the paralyzed side showed a chronic conjunctivitis due to imperfect lid closure. Several cases have remained deaf since injury, and one at least has claimed deafness occurred from the injury, though examination failed to satisfy us of this. A careful and often repeated examination is done in all cases by specialists in the Departments of Neurology, Ophthalmology and Laryngology, and reports are filed stating the results of the examinations of the fundi, ears and accessory cavities.

Occasionally a case is admitted for operation following a recent injury, where the skull lesion is the result of injury received years ago. A ship surgeon sent in a case with a letter asking for x-ray, and a request to be notified of operation at which he would like to be present.

H. E. S., case No. 3981, 1923, aged 48 years, was admitted July 28, 1923, and discharged July 31. Seven days before admission he had struck his head against a cog on shipboard, while wheeling coal in a barrow, which he emptied. He then sat down, was giddy, nauseated, vomited once, and became unconscious and remained so for two days—at least he so stated. There was no scalp wound but a soft area was felt, two and a half inches in front of the occipital protuberance, to right of mid line, where bony edges were palpable and bone was apparently depressed. He showed no local tenderness, no signs of recent trauma; and a

careful examination, after shaving, showed an old, white circular scar, with crucial scar in centre of it, the so-thought depressed area! He said that there was some trouble with his head in infancy. He was x-rayed instead of operated on, and returned to work at once. The x-rays showed an old trephine opening with rounded edges.



FIG. 10.—Old trephine opening.

Two cases have developed post traumatic insanity. One of these required a removal to Verdun Asylum for seven weeks. Both cases made complete recovery from their traumatic encephalitis. One, a custom's broker, injured in June, 1921, who was operated on fourteen days after injury for cerebral oedema, but later required removal to Verdun, is again conducting a successful business, and has even (in 1923) secured life insurance.

Delayed cerebral effects of fracture of skull or intracranial injury are sometimes seen, and the history of a patient who has developed obscure mental symptoms may suggest that trauma is the cause of the symptoms.

J. T., case No. 3504, 1921, male, aged 20 years, was admitted on August 10, 1921, with the following history. For two years he had headache, suffered from loss of memory, his disposition had changed, becoming irritable. He had also lost his standing in school; formerly he was third or fourth in his class, but later fell to the eighteenth or nineteenth, and then gave up school entirely. Afterwards he secured a job which he could not hold. He was then seen by me. There was a history of a fall on his head two years previously, but with no scalp injury. After the fall he had not been unconscious, but became very sleepy two days later; this drowsiness lasted for three weeks. A period of well being for three months was followed by the onset of supra-orbital headache, relieved by lying down; but later the headache became constant and was increased by mental effort; this accounted

for his failure at school. On examination there seemed to be some oedema of the scalp to the right of the mid line, just in front of the level of the ear tip. Percussion here sounded different, and the patient stated that it felt different. Lumbar puncture showed a high reading; 17 mm. of mercury, and 17 cells to the cubic millimetre were found. He had a slight leucocytosis, 11,000; his blood pressure was 134 and 88 (age twenty years). It was suggested that he had a brain cyst following trauma two years before, though the ocular fundi were normal. A right subtemporal decompression was done; a cyst was punctured through the normal cortex, and a director was passed into a smooth walled cavity. It was felt that this might have been a dilated ventricle, but recovery was very rapid, and has remained permanent, with relief of headaches, and return of normal good nature and mental ability, so that the operation evidently relieved the cause.

It is felt that one must not be too dogmatic about the operative treatment of intracranial injuries, and that one's judgment must be subject to change from time to time, with the varying condition of the patient. The cases that have caused us the most heartburnings have, of course, been the fatal ones, some operated upon and some not. The reason for a fatal termination in some cases has eluded us. In one a meningitis followed fifteen days after receipt of a depressed linear fracture of the right frontal bone, operated on the day after injury. The child was convalescent and was to go home the next day when he developed a sudden rise of temperature to 106°, and died in a few hours. A subdural abscess, under a healed wound, produced meningitis. The history of a second case is as follows:

N. R., case No. 5500, 1923, male, aged 36 years, was admitted October 19, 1923, following a motor accident. He showed slight shock, was restless and irrational and very difficult to control. There were areas of contusion over the right frontal and parietal regions, right subconjunctival hemorrhage, bleeding from the left ear and both nostrils, and from the left ear a free escape of cerebrospinal fluid. This was excessive for days; we measured 8 c.c. in fifteen minutes, roughly an ounce an hour. There were no focal signs of cerebral lesion on admission. The taking of x-rays was never possible. He ran a stormy course of cerebral irritation. There was no need for decompression with the escape of over 300 c.c. of cerebrospinal fluid in twenty-four hours. In spite of care for the ear he developed signs of meningitis, with a temperature of 105° rising suddenly from 99° on the first day after injury, and died twenty-two days after injury. The preceding day he had shown signs of otitis media in the ear from which the leak had occurred, and a few hours before death there was a discharge of pus therefrom. Autopsy revealed a lacerated temporo-sphenoidal lobe on this side, a local abscess and meningitis. He had a suppurative kidney condition of some standing also. He showed the usual violence of a case of cerebral laceration and contusion.

Sundry cases of epilepsy have been admitted to the service, some with scalp wounds, and all

as suspected fracture and intracranial injuries. In all cases the cerebrospinal fluid was blood free and under normal pressure, unconsciousness was short, and a history cleared up any doubt. No such case, even with scalp wounds, has been operated on. Occasionally cases show special signs and symptoms which make the diagnosis difficult.

Fracture of the skull and cerebrospinal lues has been found more than once, and a fractured skull in an old man with a monoplegia of old vascular origin gave us some trouble for a while. When the clinical findings do not fit into the proper cerebral picture of the injured area it is wise to wait for the indications to be more clearly defined. A little waiting often permits of better judgment.

M. J., case No. 5928, 1923, male, aged 39 years, was admitted into hospital November 9, 1923, after having been struck by a cab. He was discharged on November 26. He showed deep primary unconsciousness for twenty minutes and moderate shock. There was contusion of the right occipital region, right post

aural ecchymosis and bleeding from the right ear. He was irritable and restless, and had headache and vomiting. Lumbar puncture done on the day of admission showed slightly blood-stained fluid, and a pressure of 8 to 14 mm. of mercury. He showed marked optic atrophy, bilateral, and he saw poorly, if at all, with one eye. A Wassermann of blood and of cerebrospinal fluid was negative. His gait was tabetic. X-rays showed a linear fracture of the right occipital bone. Sensation was lessened below the knees and knee jerks and ankle jerks were absent. Mentally he was more or less irrational and peculiar and yet he was interested in ward doings. He was sent to the asylum after recovery from the recent injury.

I have said nothing about the severer cases of skull injury where gross lesions occur, and other injuries and fractures exist which make the case apparently hopeless from the start. These cases usually have received severe trauma, and operation would only add to their injuries. Most of these die within twelve hours after injury; some live for twenty-four to thirty-six hours, but never regain consciousness. We have felt very strongly that in such cases subtemporal or any other cerebral operation is contra-indicated.

GOITRE IN CHILDREN—A STUDY OF TREATMENT*

BY H. D. KITCHEN, M.D.

Faculty of Medicine, University of Manitoba

THE problem of thyroid enlargement is as old as the history of medicine. Many interesting and unique theories have been evolved, and been generally accepted and have then, through the efforts of some inconsiderate searcher after truth, been proven to be what they were—just theories. The painstaking research of countless investigators has slowly dispelled one after another of the old time myths, until now the problem of thyroid disease, although by no means solved, rests on a solid scientific foundation. In spite of the voluminous literature on the thyroid gland, and the constant repetition which one encounters therein, it is essential, before considering the question of thyroid enlargement, to orient oneself by briefly glancing at the milestones which mark the pathway of progress from theory toward fact.

* Awarded the Prowse Prize for Clinical Research, 1926.

Anatomy of the thyroid gland.—This is so well known that no detailed description is necessary. The chief points of interest in the present study are: 1. the vesicles, lined with a single layer of low columnar epithelium and filled normally with a sticky globulin—colloid; 2. certain nests of cells in the scanty intervesicular tissue, and thought to play a part in the formation of adenomata, a view supported by Wolffler, Marine, Plummer, and Boyd; 3. the blood supply of the gland, which is extremely copious, is derived from the thyroid arteries and finally forms a capillary network intimately surrounding each vesicle.

Physiology.—The existence of the thyroid gland was recognized by Galen, who thought its main purpose was the moistening and bathing of the larynx and passages of the throat. This view persisted, and in 1656 the principal functions, as enunciated by Wharton, were

purely mechanical—rendering the voice more melodious and aiding in the production of a more perfect contour of the neck, for which cosmetic reason the female sex had been blessed with a larger gland. An interesting theory brought forward by Simon (1844) was that the thyroid gland acted as a safety valve to the brain by the diversion of a varying amount of blood. Other theories associated the thyroid with the neutralization of toxins and the formation of erythrocytes.

This was the chaotic state of opinion when Gull (1874) reported on "a cretinoid state supervening in the life of adult women." This stimulated a new interest in the investigation of the thyroid gland, and marked the beginning of any real knowledge of its physiology which we possess. Following this, Magnus Levy in 1895 contributed his epoch-making discoveries that the heat production was decreased in Gull's disease (myxœdema), and was raised to normal by the feeding of thyroid gland. He also showed that heat production was above normal in exophthalmic goitre. These observations still rank among the most important contributions to the pharmacology of thyroid substances and our knowledge of thyroid physiology.

Experimental extirpation of the thyroid gland, performed many times, has established the facts that its presence is not essential to life; that its removal produces symptoms resembling Gull's disease; and that these are cured and the animal restored to normal health by feeding thyroid gland by mouth, thus demonstrating that the secretion of the thyroid can apparently be completely replaced by the oral administration of thyroid gland substance, a fact of great interest and clinical importance.

Cameron, in an extended series of experiments in feeding the gland tissue, using normal rats and basing the dosage on body weight, consistently produced a decrease in the growth rate and hypertrophy of heart, liver, kidney and adrenals, organs concerned with increased metabolism. The decrease in growth was always proportional to the amount of gland fed, and to its iodine content.

The first chemical discovery of note was made by Baumann (1895) who found iodine ranging from .01 to 1.16 per cent of the dried gland weight. This work stimulated numerous attempts

to isolate the active principle of the thyroid gland, and Oswald obtained a globulin, which he called thyreoglobulin, possessing the entire activity of the gland. Kendall (1915) finally isolated a substance, containing 65 per cent iodine, which he called thyroxin, a substance which, after extensive clinical tests, proved as efficient pharmacologically as thyroid gland substance. Whether or not thyroxin is the only active secretion of the thyroid gland is open to question, and some workers (McCarrison, DeQuervain, Cameron, Vincent) think that while thyroxin is probably the most important active secretion, there may be others.

On the basis of much experimental and clinical work with thyroxin Plummer has postulated his ingenious hypothesis that the essential function of the thyroid gland is to maintain the amount of thyroxin in the tissues at a constant level, approximately 14 milligrams in an adult, and that when this amount drops, a little, a stimulus is somehow sent to the thyroid which responds and brings the tissue thyroxin up to normal. Thyroxin content of the tissues and stimulation of the thyroid balance each other, i.e., when the tissue level sinks the stimulus to the thyroid to secrete increases.

Summary.—In spite of the advances which have been briefly outlined above, we still know very little of the functions of the thyroid. One function however, which is universally attributed to this gland, is the regulation of the metabolic processes of the body and the maintenance of the metabolic rate at a higher level than would otherwise be possible. McCarrison after his many years in thyroid work ably sums up our position thus:

"Though we know little, we do know this, that it is intimately concerned with the utilization of oxygen by the tissues. It supplies the draught to the metabolic fire. If the fire be overstocked, the draught must be increased to keep it burning briskly. This function the thyroid fulfils by means of its active principle, thyroxin, and for the production of thyroxin in amounts equal to the needs of the organism an adequate supply of iodine is essential. Anything which limits this supply or renders it insufficient for the needs of the organism may necessitate hypertrophy and hyperplasia of the thyroid gland."

Etiology.—It has been convincingly shown that the *raison d'être* for the development of goitre is a supply of iodine insufficient to meet the demands of the organism. It seems obvious that this iodine lack may be absolute, where the soil and water of a certain area are found to

contain less than the normal amount, thus resulting in an actual deficiency of iodine in the diet of persons resident in the area. On the other hand, there is reason to believe that in many cases, although the iodine intake may be sufficient for normal requirements, any added demand, such as that occurring in the pre-adolescent period, in pregnancy, or during emotional or physical strain will be sufficient to bring about what might be termed a relative iodine deficiency. There is also the problem of the absorption and utilization of iodine by the body. McCarrison's work led him to place great stress on the existence of a gastro-intestinal infection which interfered with *iodine absorption* and so was an important factor in the production of goitre. In his latest papers he theorizes on the possibility of a *failure of the tissues to utilize available iodine*, probably because of unexplained changes in the pH of the tissue cells. It seems possible also that dental and tonsillar infections may interfere with the absorption and utilization of iodine in the same way, and one should not lose sight of the possibility of poor hygienic surroundings having an etiological significance.

Marine has shown that when the iodine content of the thyroid gland falls below 0.1 per cent, a definite sequence of changes occurs, namely, increased vascularity, hypertrophy and hyperplasia of the cells, and finally a resting stage during which colloid is stored in excess of the normal. This view has found wide acceptance, but to accept it one must conclude that when the resting stage occurs the iodine supply has been restored to normal, in which case the goitre should spontaneously disappear. On the other hand, if the iodine supply is still deficient why should the gland rest? Plummer insists that the gland is not at rest, but has undergone compensatory enlargement because, with the handicap of deficient iodine it must work overtime in an effort to keep the tissue thyroxin at a normal level.

Pathology.—Adolescent goitre and goitre in children, are, in this country, regarded as colloid goitres, in which the principal departure from the normal histological structure is a distension of the alveoli with colloid and probably some flattening of their epithelium. In Europe (De Quervain) adolescent goitre is not, as a rule, the colloid type, but is characterized by a hyperplasia of the alveolar cells and a lack of colloid

in the alveoli. It is doubtful whether there is enough microscopic evidence at hand to enable us to call all simple, nonadenomatous goitres in children, colloid goitres.

Symptoms and course.—As a general rule, these goitres in children are symptomless and the child appears to be in perfect health. Some observers have mentioned the frequency with which signs, suggestive of hyperthyroidism, listlessness, dry skin, and lack of endurance, occur. The basal metabolic rate is nearly always normal, and is slightly below in many cases. These goitres in America are said to usually disappear about the twenty-fifth year. Some of them, however, become nodular, never disappear, and probably in later life give rise to a definite adenomatous goitre, which is always a potential danger.

Treatment.—Iodine in some form has been the standard treatment of goitre ever since Roger of Salerno used ashes of seaweed by mouth. It has often been effective and quite often not. Plummer, following up his idea that the gland was overworking, thought that by giving the bodily requirement of thyroxin, either intravenously as thyroxin, or by mouth (as desiccated thyroid) the thyroid gland would be put at rest physiologically and the colloid absorbed. This form of treatment carried out by him on a number of adolescent colloid goitres was often very successful, but it was noticed that desiccated thyroid given orally, was in many instances, not well absorbed, so that these patients could tolerate a much larger dose than a non-goitrous individual. Plummer emphasized the necessity of following the progress of these cases by repeated basal metabolic rate determinations, and thought that enough thyroid should be given to keep the rate at or slightly above normal. He, as well as others, has advised against the use of thyroid gland preparations where facilities are not available for metabolic rate determination.

Present study.—The present study concerns itself essentially with the results of treatment of goitre in children. During the past eighteen months more than 350 cases of childhood goitre have been treated in the out patient department of the Winnipeg General Hospital. Some of these have received iodine, and some desiccated thyroid gland with results in some cases good, in others disappointing. However the results were not altogether comparable, as the cases for

the different treatments were to some extent selected, as it was thought that certain types were more suitable for iodine, others for desiccated thyroid. Hence it seemed desirable to attempt to make a comparison of the two forms of treatment, and the present study presents the result of this effort.

For purposes of comparison a series of cases up to sixteen years of age was treated with desiccated thyroid, irrespective of the age or sex of the patient, duration of the goitre history, the size, consistency or vascularity of the goitre, the presence or absence of nodules, or the basal metabolic rate. The next group of cases was treated with iodine, given orally as Lugol's solution, while in a third series no treatment was given. The total number of cases, while not great, offers a fairer comparison than would be obtained by selecting the cases. All of the patients have been under observation during late fall, winter, or early spring, so one group should not be more subject than the other to seasonal variation.

In our original history of each case inquiry was made as to family history with reference to goitre, number and ages of brothers and sisters, goitrous and non-goitrous. The type of diet in the home with especial reference to milk, eggs, green vegetables (supposedly iodine-rich foods), the grade at school and the activities of the child were also included, as well as the menstrual history in the case of the older girls. The history of the goitre was carefully elicited with regard to duration, symptoms, if any, fluctuations in size, and previous treatment. Only a few cases gave a history of any former treatment. Physical examination included height, weight, blood pressure, and pulse rate, a record of findings in teeth, tonsils, heart and lungs, and a description of the thyroid gland—its size (slight, moderate or marked), consistency (soft or hard), the presence or absence of palpable nodules, thrills or bruits, and the circumference of the neck. In addition, the transverse and longitudinal measurements of each lobe (in c.m. or inches) was recorded, the palpation being done after the manner of Plummer. In measuring the circumference of the neck the lower border of the tape was placed at the upper margin of the seventh cervical spine and the reading taken around the most

prominent part of the neck, as described by De Quervain.

Those cases in which the neck looked normal and in which only a very tiny band of thyroid tissue stretching across the midline could be felt are not included in this series as it seems incorrect to apply the term "goitre" to these. We have used the term only where one or both lobes of the gland could be definitely palpated. The classification of size is the same as that used by McRae and Hamilton in their paper on Winnipeg school children, *slight*—being barely perceptible to sight or touch; *moderate*—those which though not unsightly can be noticed by the layman, and *marked*—those in which the lobes of the gland definitely stand out with deformity of the neck.

Our cases were with very few exceptions in good general health, and had no complaints other than the goitre. Physical examination was in practically all cases negative otherwise, but questionable teeth and tonsils occurred occasionally, as often in one series as in the other. None were clinically hyperthyroid.

Basal metabolic rate determinations were made before treatment was started, the machine used being a closed-circuit type of apparatus (Sanborn-Benedict), this particular machine allowing, in normals, a variation of from plus 15 to minus 4 as determined by Professor Cameron of the Department of Biochemistry. Only one reading was made but this was preceded by a short preliminary period to familiarize the patient with the apparatus, which is the usual practice in the laboratory of the Winnipeg General Hospital, and has the advantage of often making a second rate unnecessary. A perusal of the results shows that most were within normal limits or slightly below. The few which were above plus fifteen were not clinically hyperthyroid, but owing to the demand on the laboratory could not be repeated.

Treatment.—Patients receiving desiccated thyroid were in practically all instances started on two grains daily, a dosage which was continued in some cases for from four to six months without the production of any untoward symptoms. In some cases where the goitre rapidly decreased in size, and in a few who developed headache, tachycardia, or failed to hold their weight, the daily dose of thyroid was reduced to one grain, which was continued until no

further change in the size of the goitre could be detected after several visits at monthly intervals. It was thought that no more could then be expected from thyroid therapy which was stopped and iodine commenced with a view to preventing subsequent enlargement.

All but a very few of the patients receiving iodine were given one minim of Lugol's solution in water on alternate days, (the rest received one minim daily), making a total dosage of iodine equal, roughly, to 130 mg. in one month, an amount probably much larger than necessary, according to Marine and De Quervain.

While under treatment, which has ranged in most cases from three to six months, the patients have been seen periodically, those on desiccated thyroid once a week at first, then at longer intervals. No attempt was made to determine the metabolic rate at intervals as recommended by Plummer, but instead we used smaller doses of thyroid over a longer period of time—thus working more in the position of the general practitioner who would probably not have laboratory facilities at hand. At each visit patients were questioned regarding headache (and nervousness), and weight and pulse

rate were noted carefully. The size of the thyroid was also recorded, both by palpation and measurement of the circumference of the neck. After some practice the manual palpation gives a more reliable index, as one can get surprising variations with a tape line, measuring the same neck a number of times in quick succession, probably on account of a slight difference in the tension of the tape or failure to measure exactly in the same place. At the same time this method gives valuable information in cases where the gland volume has markedly changed under therapy. (McCarrison estimates that a reduction of one inch in circumference means a decrease in volume of one-half). Often the patients or their mothers volunteered the information that the neck was smaller, or larger, and note of this was always made. The integrity and impartiality of the observer in making measurements are, needless to say, of paramount importance.

Evaluation of results.—This is difficult, as stated above, on account of the lack of a definite and uniform standard of measurement. Also, one cannot control the life of the patient during treatment and know the amount of physical and mental stress to which he has

TABLE I.—CASES TREATED WITH DESICCATED THYROID

Age in Years										Sex		Size of Goitre			Nod- ules	Vascularity		B.M.R.		Degree of Improvement			Length of History
8	9	10	11	12	13	14	15	16	M	F	slight	mod- erate	mark- ed		thrill	bruit	min- us	plus	none	slight	mark- ed		
			1							1	1			?			14					recent (a)	
					1					1	1		1				5					recent	
				1						1	1		1				9					recent	
							1			1	1		1					4	1			4 years	
				1						1	1		1					10			1	2 years	
				1						1	1		1	1				15		1		5 years	
					1					1	1		1					14			1	1 year	
										1	1		1					4	1			2 years	
								1		1	1		1	1				0		1		2 years	
										1	1							8				recent	
										1	1							9			1	years	
									1	1			1		?			11				recent	
										1			1	1		?		10			1	recent	
										1			1					5		1		recent	
										1								1			1	1 year	
										1			1	1	1	1		11			1	2 years	
										1	1		1		1	1		5		1		2 years	
																	1			1		recent	
										1								4	1			3 years	
										1			1					6				recent	
										1			1	1	1	1					1	1 year	
										1			1				3				1	2 years	
										1			1					5		1		recent	
										1			1					12			1	recent	
										1								1	1			recent	
0	0	1	1	8	4	2	6	2	3	21	6	6	12	7	3	3			4	11	9		

(a) Less than one year.

amount of improvement obtained in the first three months of treatment indicates the degree of result to be obtained by a further continuation of therapy. The number of cases improved by iodine treatment (62 per cent) compares favourably with 65 per cent improvement reported by Marine in his study of Akron school girls after three years of iodine therapy.

Conclusions.—While the series of cases is not large, and although probably the work was not controlled as well as possible, nevertheless it seems permissible to state that:

1. Desiccated thyroid, in safe doses, produced a greater number of marked improvements and less failures than did iodine or the expectant therapy in the treatment of goitre in children.

2. There were no cases of iodine hyperthyroidism as a result of the use of iodine.

3. Desiccated thyroid, used in small doses, (grains 1 to 2 daily), produced no untoward effects, though given continuously for several months in some cases.

4. Desiccated thyroid may safely be used in the treatment of goitre in children, even without the facilities for frequent metabolic rate determinations. Frequent observation of the

patient must be insisted upon, however, and careful note made of the general health, the pulse rate, and the weight. The occurrence of any or all of the following—frequent headache, increasing pulse rate or nervousness, or a loss of weight, is an indication to stop or reduce the thyroid therapy.

5. Treatment is important, for although failing to effect a reduction in the size of the goitre, one may perhaps prevent further enlargement. The sooner treatment is started and the longer kept up the better the result to be anticipated.

6. The prevalence of thyroid enlargement in children is serious. When it is considered that one out of every twenty goitrous mothers give birth to mentally defective or imbecile children (McCarrison), and that the goitrous girls of to-day are the goitrous mothers of to-morrow the significance of the problem needs no further emphasis.

NOTE: I wish to acknowledge the valuable assistance of Miss S. Bentley of the Social Service Department of the Winnipeg General Hospital. Without her untiring efforts the essential following up of these cases would have been impossible.

TABLE III.—SHOWING THE CASES NOT TREATED—CONTROLS

Age in Years																Sex		Size of Goitre			Nod- ules	Vascularity		B.M.R.		Degree of Improvement			Length of History
8	9	10	11	12	13	14	15	16	M	F	slight	mod- erate	mark- ed		thrill	bruit	min- us	plus	none	slight	mark- ed								
4½					1					1	1		1	1				3	1			recent							
										1				1				0	1			1 year							
										1		1		1				10	1			2 years							
										1			1	1				1	1			recent (a)							
										1			1	1				13		1		3 years							
										1				1				4			1	2 years (b)							
										1	1	1										recent							
										1	1			1	?			2	1			recent							
										1	1	1			1	1		0	1			recent							
			1							1	1	1			1	1		30	1			recent (c)							
										1	1			1	1			10	1			recent							
										1	1	1						3	10	1		recent							
										1	1		1					7	1		1	2 years (d)							
										1	1			1									2 years (e)						
										1	1			1				14			1		recent (f)						
										1	1			1					12	1			recent						
									1	1			1	1			1	1	1			1 year (g)							
									1	1		1	1					7	1			recent							
									1	1		1							1	1		recent							
									1	1	1							14	1			1 year							
									1	1			1	1					1	1		recent							
									1	1				1				1	1			3 years							
1	3	1	2	3	5	5	2	2	4	20	9	8	7	8	1	1			20	2	2								

(a) Less than one year; (b) Septic tonsils out; (c) Previous iodine; (d) Previous treatment; (e) Nervous; (f) Previous treatment; (g) Definite adenoma.

TABLE IV.—SHOWING A COMPARISON OF THE THREE GROUPS OF CASES

Cases on Iodine Treatment

Age in years	number of cases	Sex		Size of Goitre			nodular	vascular	B.M.R. 1 reading					Degree of Improvement		
		M	F	slight	moderate	marked			-15 to -11	-10 to 0	+1 to +9	+10 to +15	over +15	none	slight	Marked
8	2		2	1		1	1	1			1		1	1		
9																
10	1		1	1							1					
11	2		1	1	1						1			1	1	
12	5		5	2	1	2	1	1		1	2	1	1	1	2	2
13	2	1	1	1		1			1		1			1	1	
14	7	3	4	3	1	3	3	1	1	1		2	1	2	2	3
15	3		3		2	1	2			2				1	2	
16	2		2	1	1	1				1	1			2		
	24	4	20	10	6	8	7	2	2	4	9	4	3	9	9	6

Cases on Desiccated Thyroid Treatment

8																
9																
10	1		1	1							1			1		
11	1		1	1					1						1	
12	8	2	6		2	6	4	2			4	4		1	4	3
13	4		4	1	1	2				1	3			1	1	2
14	2		2	1	1					1	1			1	1	1
15	6	1	5	2	1	3	2	1		2	3	1		3	3	3
16	2		2		1	1	1			1	1			1	1	1
	24	3	21	6	6	12	7	3	1	5	13	5		3	11	10

Cases Without Treatment—Controls

8	1		1	1										1		
9	3	1	2	2	1		1							3		
10	1		1	1							1	1		1		
11	2	1	1		2									1		1
12	3		3	3			1		1	1		1		2	1	
13	5	1	4	1	2	2	1			1	3	1		5		
14	5	1	4		2	3	3	1		1	1	2		5		
15	2		2	1	1					1	1			1		1
16	2		2			2	2				1	1		1	1	
	24	4	20	9	8	7	8	1	1	4	7	7		20	2	2

TABLE V.—GIVING A SUMMARY OF THE EFFECT OF TREATMENT IN ALL CASES

Number of cases, all ages up to 16	Treatment	Degree of Improvement in percentages			Total
		none	slight	marked	
24	Thyroid	16.6	45.8	37.5	83.3
24	Iodine	37.5	37.5	25.0	62.5
24	Controls	83.3	8.3	8.3	16.6

BIBLIOGRAPHY

Only a few articles of special interest in the present study are listed below

- (1) BOYD, WILLIAM, Surgical pathology, W. B. Saunders Co., Philadelphia, 1925. (2) CAMERON AND CARMICHAEL, Effects of thyroxin on growth in white rats, *Jour. Biol. Chem.*, 1921, xlii, 35. (3) CAMERON, A. T. AND CARMICHAEL, J., Acceleration of growth and regression of organ hypertrophy in young rats after cessation of thyroid feeding, *Trans. Royal Soc. of Canada*, 1922, xvi, 57. (4) CAMERON, A. T. AND CARMICHAEL, J., After effects of thyroid feeding in young rats, *Trans. Roy. Soc. of Canada*, 1924, xviii, 105. (5) DE QUERVAIN, Goitre, Wm. Wood and Son, 1924. (6)

- HABIEN, H. C., Management of colloid goitre cases, *Minnesota Medicine*, 1925, viii, 734. (7) HAMILTON, T. G. AND McRAE, D. F., Incidence of goitre among Manitoba school children, *Can. Med. Ass. Jour.*, 1925, xv, 1017. (8) JACKSON, A. S., Goitre in children, *Arch. of Pediat.*, 1925, xlii, 363. (9) KENDALL, E. C., Chemistry of the thyroid gland, *Jour. Am. Med. Ass.*, lxxxiii, 1167. (10) MARINE, D. AND KIMBALL, Prevention of simple goitre in man, 4th paper, *Arch. of Internal Med.*, 1920, xxv, 661. (11) MARINE, D., Present status of the functions of the thyroid gland, *Physiol. Reviews*, 1922, 521. (12) MARINE, D., Importance of our knowledge of thyroid physiology in the control of thyroid diseases, *Arch. Internal Med.*, 1923, xxxii, 811. (13) MARINE, D.,

Etiology and prevention of simple goitre, *Medicine*, 1924, iii, 458. (14) MCCARRISON, R., Goitre, *Brit. Med. Jour.*, 1924, i, 989. (15) MCCARRISON, R., Some problems of thyroid disease, *Brit. Med. Jour.*, 1925, i, 1065. (16) McCLENDON, J. F. AND WILLIAMS, AGNES, Simple goitre as a result of iodine deficiency, *Jour. Am. Med. Ass.*, 1923, lxxx, 600. (17) McCLENDON, J. F. AND HATHAWAY, Inverse relation between iodine in food and drink and

goitre, *Jour. Am. Med. Ass.*, 1924, lxxxii, 1668. (18) PLUMMER, H. S., Chapter on diseases of the thyroid, *Oxford Medicine*, iii, (19) PLUMMER, H. S. AND BOOTHBY, W. M., Administration of thyroid preparations, special article, *Jour. Am. Med. Ass.*, lxxxiii, 1333. (20) PLUMMER, W. A., Iodine in the treatment of goitre, *Med. Clin. of North Amer.*, January, 1925, 1145. (21) VINCENT, SWALE, Internal Secretion, Macmillan Co., 1922.

THOUGHTS ON RHEUMATISM*

By A. D. BLACKADER, M.D.

Montreal

IN opening the discussion on acute rheumatic fever in children I must confess that I feel the position, using the words of Dr. Poynton under similar circumstances, to be a dangerous honour, as our views on the conditions involved have changed greatly during the past few years. Not forty years ago, Drs. Fagge and Pye-Smith in their classical work on *The Principles and Practice of Medicine* wrote "there is no true carditis as there is no true inflammation of the brain. The inflammations of the heart do not directly concern the muscle, but only the covering and lining membranes.""

In 1909, Dr. Norman Moore of St. Bartholomew's made the statement that in acute rheumatic fever, endocarditis was the important condition. Every case of rheumatic fever, whether pain in the joints is slight or severe, is to be regarded as a case of endocarditis. Infection of the endocardium is not to be considered as a frequent complication, but as the essential and invariable feature of acute rheumatism. In opposition to these statements Sir Thomas Horder¹ only a few weeks ago in his Lumleian lectures before the Royal College of Physicians stated that there is involvement of the heart muscle in so great a proportion of the cases, that it is wise to assume that it may be involved in all, and this even in the absence of any definite physical signs. Especially is this the case when the disease occurs during childhood; further on he states "a more exact knowledge of the inflammatory changes which take place in the heart as the result of the rheumatic

infection has led to a realization that the lesion produced is a pan-carditis, rather than an endo- or peri-carditis; so much is this the case that the exact amount of endocarditis has become of secondary importance."

Dr. Cotton of London in a paper appearing last month in *The Canadian Medical Association Journal*, also writes as follows: "The main purpose in auscultating heart sounds in acquired heart disease is to determine the presence or absence of mitral stenosis and of aortic insufficiency. Signs of definite valvular disease of these two types demand recognition, because of their prognostic importance; they indicate structural changes in the myocardium which lead in time to heart failure." "The mechanical obstruction of a narrowed mitral orifice, except in rare cases, is a small factor in the production of failure of the congestive type. The hypertrophied or dilated left auricle is due to a rheumatic infection of the auricular wall. The systolic murmur regarded formerly as due to regurgitation, as an isolated sign, is of no prognostic importance. Those who hope to improve the condition of a patient by cutting the mitral valve and in this way relieve the obstruction must realize that such surgical intervention is unjustifiable."

Such statements made by men who must be regarded as leaders in our profession more or less upset all our previous views, and it behoves me to speak very cautiously this morning.

All of us, however, must recognize the fact that while in the past tuberculosis was the cause of the highest death rate in our statistics, and demanded the first place in our thoughts and in our efforts, heart disease during the past few years has taken its place. Its mortality rate

* A paper read at the Fourth Annual Meeting of the Canadian Society for the Study of Diseases of Children, Gananoque, June 11, 1926.

now exceeds that of tuberculosis and of cancer.

The more important causes of heart disease are rheumatism, certain bacterial infections, syphilis, and the degenerative diseases of old age. Of these, acute rheumatic fever is the most important etiological factor of heart disease in childhood, and demands earnest consideration. Statistics also show us that it is during the early years of life that this disease is most frequently met with, and that at this age its effects are most disastrous. In every attack of rheumatic fever the action of the infective agent on the heart is the condition demanding the greatest attention from us.

We are yet in ignorance of the definite exciting agent of acute rheumatic fever. Until this agent has been isolated and studied, increase of our knowledge regarding the disease can be gained only by careful observation of the conditions influencing its occurrence, its course and its cure. In childhood, unfortunately, its onset rarely manifests the outstanding features met with in adults. Malaise associated with pallor, moderate fever, and not infrequently tonsillitis, may be the only symptoms, and these at the beginning may attract little attention from the parents. When the persistence of the symptoms demands the investigation of the physician, the heart tissues are frequently found to be seriously involved.

In reply to a personal letter, Dr. Leonard Finley of Glasgow wrote me that the most important fact in his opinion which emerged from an investigation of 141 cases of rheumatic infection admitted to the Royal Hospital for Sick Children was the apparent influence of *heredity*.

Of 200 families in which well declared rheumatic symptoms were present, there was a definite history of heredity in 74 per cent of the first hundred, and in 36 per cent of the second hundred. Using for comparison cases which had been admitted to hospital suffering from other diseases, such as acute pneumonia, or acute nephritis, a preceding family history of rheumatism was obtained in only 9 per cent. The family income, the hygienic conditions in the family home and its surroundings, and even a minimum of parental care given the children did not seem to have an important influence in predisposing to an attack. Regarding infection arising from carious teeth and septic tonsils, Dr. Findlay, somewhat to my surprise, did not

feel able to express an opinion. He said the majority of children in the hospital had some carious teeth; chronic tonsillitis he did not think was very common. He himself was rather opposed to the view held by many in America that tonsillectomy prevented the occurrence or recurrence of a rheumatic attack. Poynton and many London physicians, however, appear to be convinced that tonsillectomy has a definite influence in averting an attack. At the last meeting of the British Medical Association in Bath, he stated that, while he recognized that enucleation might not prevent in all cases an attack and its sequelae, nevertheless, he regarded tonsillectomy as a valuable prophylactic step.

In an investigation carried out a few years ago by William St. Lawrence (*Jour. Am. Med. Assn.*, December 16, 1922, vol. lxxix) the frequency with which cardiac disease was observed in two or more members of the same family was regarded as impressive. The question as to *whether cardiac disease was communicable* from one child to another, and if so by what exact means it was disseminated, in his opinion received too little attention. As cardiac disease appeared to be of bacterial origin, it was considered by St. Lawrence to be of great importance that the mode of its dissemination should be carefully investigated. Comparing it with tuberculosis, he pointed out that once tuberculosis was recognized as a communicable disease, more effective measures were adopted for its eradication.

With this in view St. Lawrence made a very careful investigation of 100 families selected alphabetically from the names on the register of the children's cardiac clinic of St. Luke's Hospital, New York. Sixty-three of these families were studied very completely. In the remaining 37 families it was not possible to examine 46 individuals because of sickness, absence from home, and poor co-operation. The total number of individuals studied was 580. Sixty per cent of these were children and adolescents. In the investigation only persons who had suffered from acute rheumatic fever, chorea or cardiac disease were regarded as having been the subjects of a true rheumatic infection. Any who had suffered merely from myositis, indefinite bone and joint pains, and recurrent attacks of sore throat, were not included in the series; the diagnosis of rheumatic cardiac disease was

only made in those cases in which definite physical signs were present. The results obtained were very interesting. Excluding the 100 children attending the cardiac clinic, of the 480 remaining persons exposed in their families 71 or 14.8 per cent presented evidence of rheumatic infection. Of these 71, 38 were found to suffer from disease of the heart, an incidence which far exceeded that among the general population. When rheumatic disease of the heart was found in one member of a family, there was therefore one chance in two that at least one other member would be found to suffer from the same trouble. In a similar investigation carried on in a similar group of families to determine the presence of tuberculous infection contracted by contact, the number of persons found affected was 14.6 per cent. It will be seen, therefore, that in these two similar series of cases those families having one member the subject of rheumatism are slightly more liable to have other members suffering from the same disease, than if the infection were tuberculous. With the weight of professional opinion in favour of the family group as an important means of disseminating tuberculosis, the question arises whether a less serious attitude may be safely adopted towards rheumatic fever.

Professor W. G. MacCallum in an address last year upon rheumatism (*Jour. Am. Med. Ass.*, May 23, 1925, vol. lxxxiv) stated that while there would appear to be much evidence in favour of the idea that rheumatism is a hereditary disease, it seemed more plausible to regard it as an *infectious transmissible disease* in which the infection in a house may spread especially to the young much as it does in tuberculosis.

In a recent paper by Dr. George Draper (*Science*, May 22, 1925, vol. lxi) he questions whether the factor of susceptibility or predisposition to disease is not of equal importance with the external specific agent. Modern workers in his opinion are directing intensive studies at the lesion itself, and are in search of a special external agent, frequently overlooking the factor of susceptibility, which is obviously an integral part of one's constitution. The thoughtful physician finds himself not only a student of disease but also of the natural history of man. A comprehensive study of this question must consider life at its various epochs, and in relation to the development of the

various glands of internal secretion—glands which to a great extent appear to determine personality and constitution. He considers that it has been found possible by observation to correlate morphology with predisposition to certain diseases. How far this may be the case in rheumatic fever and heart disease it would seem difficult to say.

More important, as regards the specific action of the rheumatic poison on the valves of the heart, are the investigations of Louis Gross² on their vascular supply. He has shown that these delicate membranes are still actively vascular during the early years of life, the period when they are specially susceptible to infection, but the vascularity varies in different individuals. That susceptibility to the development of endocarditis may depend on the amount of vascularity in the membranous valve tissue would appear to be a probability. Since Gross's observations the view that during postnatal life the edges of the valve are entirely avascular must be regarded as an error.

A particularly interesting paper upon the many problems of rheumatic infection has recently appeared, written by Dr. Homer Swift of the Rockefeller Institute, (*Amer. Jour. Med. Sc.*, November 1925, vol. clxx). He considers that as the etiology of rheumatic fever remains still obscure, we are forced to compare the infection with others the nature of which is better understood. Rheumatic fever like tuberculosis and syphilis is an infection with a great variety of manifestations; some of comparatively short duration leave comparatively slight damage in their trail; other manifestations take a chronic course and inflict deep seated injury. Periods of latency in all three may be a confusing factor. Many years may elapse between the date of acquiring the infection, and the appearance of certain symptoms. Haven Emerson³ states that in some instances five years may elapse between the date of early infection and the first recognition of heart damage. Swift also states that periods of latency may exist in rheumatic fever as in tuberculosis and that comparable factors in heredity and environment may play a rôle in the etiology of both diseases.

The tendency for an attack of rheumatic fever to recur in childhood has long been recognized. Swift considers that this fact may be regarded from two points of view. The first

is that the sufferer is specially susceptible to the infection, and that each attack is the result of a reinfection, possibly in the same way that repeated attacks of lobar pneumonia may be due to different types of pneumococci. Another view, however, is that the various acute attacks are evidence of relapses of an infection imperfectly cured, or possibly undergoing periods of latency and activity; and the recurrence or chronicity of rheumatic fever in children is to be regarded as evidence of the capability of the etiological agent to persist in the tissues of the body.

Dr. Swift considers that combined clinical and histo-pathological studies would indicate that there are two types of response on the part of the tissues to the invasion of the causative agent of this disease, a proliferative and an exudative lesion. At the bedside the only indication of the proliferative lesion is the subcutaneous nodule not always to be seen. The exudative response is evident in the swelling, pain and tenderness of the arthritis. He thinks we can better interpret the symptoms of the disease as well as its peculiar course, if we remember that both types of response may occur at the same time in the tissues. A characteristic feature of the exudative lesion is the disappearance of the exudation and of the symptoms dependent upon it, following the exhibition of effective doses of a salicylate. This drug, however, fails to influence the proliferative lesion which would appear to be the more serious of the two. This lesion manifests itself as a focal, interstitial inflammation, situated in the tissue around the smaller arteries and arterioles producing the submiliary nodule known as the Aschoff body. The peculiarity of this lesion according to Swift is the presence of giant cells of a somewhat different type from those seen in tubercle. These nodules are found in the mural endocardium, and their presence in great numbers in the left auricle has been demonstrated by MacCallum. Swift considers that an essentially similar proliferative process is responsible for the valvular changes. In previous descriptions of rheumatic endocarditis the chief stress is laid on the very obvious verrucæ. Careful microscopic examination of the valve itself, however, never fails to reveal important interstitial changes occurring throughout the major portion of the leaflet. Recently the op-

portunity has been afforded in the Rockefeller Institute of examining the valves of four patients dying during the first attack of the disease and while the condition in the valves was acute.

As a deduction from the conditions observed in this examination it would seem that the primary reaction in the rheumatic infection of the valves is in the interstitial tissues, and that verrucæ are due to the deposition of thrombi on that portion of the valve where the vitality of the endothelial and subendothelial layers of the endocardium has been impaired as the result of repeated impacts of the swollen tissues of the valves against one another. This theory that the necrosis of the endocardium is due to mechanical trauma on an inflamed structure offers a rational explanation of the localization of the vegetations at a distance from the free margin of the valve. Carey Coombs⁴ has also marshalled convincing evidence that interstitial valvulitis is the important feature of rheumatic endocarditis.

Rheumatic infection appears to some extent to be self-limited, and there is a definite tendency for the symptoms to improve if the patient is kept quiet and in bed. Dr. McPhedran in a paper which appeared recently in this *Journal*⁵ relates an interesting example of this. If the patient is kept under the influence of salicylates the clinical symptoms of the disease however are relieved; in itself this is favourable. But unfortunately the cardiac condition may persist, and children should not be allowed to be up and about which may be harmful. More careful instrumental examination of the patient would detect signs of the presence of a still active inflammatory condition. Leucocyte counts made at weekly intervals will serve as an index of the persistence of this reaction. Study of the heart with the electrocardiograph will also furnish evidence that there is functional disturbance in over 90 per cent of such patients. The only sane conclusion to be drawn is that the heart is affected in practically every patient suffering from even a mild attack of rheumatic fever, and that rest and time are demanded in order to permit the interstitial inflammation to subside.

Undoubtedly, the most important factor in the effective treatment of rheumatic fever is recumbent rest. To permit a patient to be about

while any interstitial reaction is going on either in the valves or in the heart muscle cannot be regarded as the best means of promoting convalescence and conserving strength. Dr. Swift calls special attention to the length of time that in the Rockefeller Hospital it is deemed necessary to keep patients at rest before the complete subsidence of the symptoms is assured. Anti-rheumatic measures are employed to reduce the arthritis and the temperature; all diseased foci in tonsils and teeth are removed as soon as may be deemed wise. Nevertheless, emphasis is laid on the necessity of complete rest until all indications of active infection have passed away. In the majority of cases this period extended to the 120th day; in a few to the 180th and even to the 240th day of rest. Swift adds that this period spent in hospital was always supplemented by an average of from two to six weeks in a convalescent home after the patient has left the hospital.

It is perhaps interesting to note here that Horder states that there seems to be little doubt that cases of a severe type are less common than formerly. He questions whether we now see the severe cases of hyperpyrexia and cases with cerebral symptoms which were apparently common fifty years ago; he adds, of almost daily occurrence. Even when Church wrote he thought that cases of pericarditis had become less frequent and questioned whether this was due to

the use of salicylates. Quoting Swift's line of thought Horder thinks that it is quite possible that the exudative response of the tissues to the rheumatic virus has become distinctly less severe, whereas the proliferative changes have remained as severe as formerly or even increased in severity.

In conclusion we may say in reference to the prevention of an attack that an impaired state of nutrition, a chronic infection of the tonsils and exposure to dampness, sudden chill, and over fatigue, must always be regarded as conditions predisposing to infection. When these are associated with an hereditary predisposition the probability of an attack developing must be great. Anæmia and loss of weight mark the course of the infection. The patient's weight curve in Swift's opinion is a good auxiliary guide in helping us to determine whether or not the patient is making headway in overcoming the toxin. During the attack the maintenance of nutrition as in so many other infections must be regarded as an important therapeutic measure.

REFERENCES

- (1) HORDER, THOMAS, *Brit. Med. Jour.*, April 3, 1926. (2) GROSS, LOUIS, Blood supply to the heart in its anatomical and clinical aspects, Hoeber, New York, 1921. (3) EMERSON, HAVEN, *The Survey*, Nov. 1, 1926, liii, No. 3. (4) COOMBS, CAREY F., Rheumatic Heart Disease, Wright & Sons, Bristol, 1925. (5) MCPHEDRAN, A., Cardiac disease, *Can. Med. Ass. Jour.*, June, 1926, xvi, 627.

Very Late Abscesses in Post-Operative Scars

—It is a common experience that suppurating wounds, after they have apparently healed, may develop recurrent abscesses within several days or a few weeks. It is unusual for trouble to manifest itself later than this. William A. Fisher, Jr., and Harvey B. Stone, Baltimore, present four cases. One was in origin a heavy infection, with drainage (gangrenous appendicitis with localized abscess). In one case, there was potential infection, and drainage was done; a gallstone in the papilla of Vater was removed by the transduodenal approach. In the third case there was a history of stitch abscess during convalescence from appendectomy. The fourth case was a clean hernia operation without any evidence of post-operative infection so far as the wound was concerned. This incidence of a pre-

vious infection of the wound in three out of four cases is of great significance, but perhaps of more arresting interest is the fourth case with no such antecedent history and yet with a definite abscess very late after operation and the discharge of a foreign body. All four of these operations involved the soft parts of the abdominal wall, with no involvement of bone or joint. A foreign body was found in the single case which had no history of a previous infection at the original operation, and also in the appendix abscess case. In a third case the abscess was opened in a private office, and no cultures were made. The remaining abscess gave a growth on culture that was identified as the unusual organism—at least in surgical experience—*B. alkaligenes*.—*Jour. Am. Med. Ass.*, May 29, 1926.

RESULTS OF THE USE OF SCARLET FEVER ANTITOXIN*

BY H. B. CUSHING, B.A., M.D.

Montreal

IT is now nearly two years since the use of a specific antitoxin for scarlet fever was introduced, and for over a year an abundant supply has been available to every practitioner, so that the effects of the serum should be no longer problematical, and we should have clear ideas as to what may be expected from the use of the serum and what there is no hope of its accomplishing.

The following conclusions are based on the results observed from the use of the serum in the Alexandra Hospital for Contagious Disease at Montreal during the past year.

Scarlet fever was fairly prevalent in Montreal during the winter of 1925 and 1926, most of the cases being of a mild type, but with occasional severe ones. In all 800 cases were observed of which 5 per cent might be classified as severe scarlet fever, the remainder being moderate or mild. Of these, 500 cases were treated with serum. For comparison we have the statistics of the previous year in the same institution of 1073 cases of practically the same type of disease. The serum used was obtained from a number of different sources, some prepared by the Dick method, some by the Dochez method, and some by a combination of both. Apparently the action of the different preparations differed only in degree, the effects varying according to the strength and concentration of the preparation. The usual dose was 10 c.c. of serum given intramuscularly at the earliest possible moment in the course of the disease. The dose was only occasionally repeated, and in a few toxic or septic cases was given intravenously. The rule throughout the year was to give a full dose of serum to every definite case of scarlet fever on admission, unless the case was extremely mild (temperature under 100°), or there was some contra-indication such as a history of asthma or of idiosyncrasy to horse

serum. This number, *i.e.*, 500 cases, should be sufficient from which to draw definite conclusions, especially if we compare our results with the hundreds of other cases, in which the results of observation of the effects of serum have been published during the past year.

In these results, certain effects of the serum are obvious, and agreed on by all observers; these will be spoken of first; others are more doubtful and will be referred to later.

Scarlet fever is typically a seven-day fever, the temperature beginning to fall on the fifth day with subsidence of the acute symptoms, such as eruption and sore throat. There are two common variations of this course:

First; cases in which the fever subsides as usual, and then rises again with the development of some complication.

Second; the septic form where the fever runs continuously for three or more weeks with various purulent discharges and suppurative complications. The most constant and certain effect of serum if given during the first week of the disease is to produce a *marked fall of temperature*. This is a characteristic uniform reaction which occurs in all cases. There is usually a slight rise of temperature in two to four hours after the serum is given, then a steady decline during the next twenty-four hours, so that the result is most marked twenty-four to thirty-six hours after the administration. This applies to serum given subcutaneously or intramuscularly, if given intravenously, the reaction is more prompt and the fall of temperature occurs within twelve hours. If the case is severe or the serum is not given within the first two days of the disease, the temperature usually does not fall to normal but continues on a lower level than before the use of serum. This fall of temperature is so constant that if it does not occur one can be certain there is an incorrect diagnosis or some other condition or complication is present. A large dosage makes the fall of

* Read before the Canadian Medical Association, Victoria, June, 1926.

temperature more marked, and certain preparations of the antitoxin seem to give a more marked fall of temperature than others.

The effect on the pulse rate is just as marked and constant as on the temperature, and occurs at about the same time.

After the use of serum the eruption fades very quickly. If the serum is given within the first twenty-four hours of the disease, the rash disappears within twelve hours; if the serum is not given until later, when there is an actual inflammation of the skin, the effect on the rash is not so complete or rapid. The characteristic desquamation is apparently directly dependent on the eruption. If the serum is given early and the rash fades quickly there is very little subsequent desquamation, but if given later when pathological changes have taken place in the skin, the peeling may be quite marked. This rapid disappearance of the rash and absence of desquamation is worth noting as it sometimes leads to the diagnosis being doubted.

An equally striking effect of the serum but one which is harder to measure or demonstrate is the great change in the toxic condition, and in the subjective sensations of the patient. There is a disappearance of the delirium, the headache and the joint-pains. This is, of course, most noticeable in adults, who usually proclaim the day after the use of serum that they are quite well again, and want to get up and to have more to eat. The whole aspect of the acute scarlet fever wards has been entirely changed since the general use of serum, as there are practically no sick patients.

The effect on the sore throat, swollen glands and discharges from the nose and throat is about parallel to the other effects of serum. If the serum is given early the effect is very marked; if later, when actual changes have taken place it is not so marked. Incidentally the characteristic raw, red, 'strawberry' tongue, so noticeable about the fourth day of the disease, is much less apt to occur after the early use of the serum.

To sum up the results obtained from the use of the serum, thus far, all observers agree that the first week's fever with all its toxic manifestations (sore throat, rash, rapid pulse, delirium, etc.) is cut short or aborted by an adequate dose of an effective preparation of antiscarlatinal antitoxin. No one who has

observed a large series of cases can doubt this for a moment, and not even in diphtheria is the effect of serum more marked and constant.

We come next to the effect of serum on the well-known complications of scarlet fever. I think the question I am most frequently asked is, whether serum prevents or influences the dreaded complications of the disease. There are two or three points in this connection, on which I believe all observers are agreed. In the first place, no one yet has claimed that scarlet fever serum altogether prevents complications even when given as early as possible and in large doses. In my own series of 500 cases all the ordinary complications were observed; even in those cases in which the serum was given within the first two days. Next, I have not observed, nor to my knowledge has anyone claimed, that when the complications have once developed they are to any degree affected by a subsequent dose of serum. On the other hand it is perfectly obvious that any treatment, which is going to shorten the course of a disease, and improve the condition of the patient (both of which scarlet fever serum certainly does) is going to lessen the number and severity of the complications, as the resisting powers of the patient are improved. This is amply borne out by all statistics of sufficient extent. In my own observations, in 1924 of 1073 cases of scarlet fever 45 per cent developed complications of some sort. Of 800 cases of scarlet fever since the general use of serum only 25 per cent developed any complication and these were for the most part of a milder character. Thus before the use of serum 15 per cent developed cervical adenitis in some form and of these 15 per cent suppurated. After the general use of serum only 12 per cent had adenitis and only 10 per cent of these suppurated, thus the proportion of suppurative adenitis was exactly cut in half.

As regards otitis media, before serum 14 per cent had otitis and 18 per cent of these required a mastoid operation. With serum only 8 per cent had otitis and only 8 per cent of these required operation, thus mastoidectomies were reduced to one-fourth of their former frequency.

The percentage of acute hæmorrhagic nephritis was very low in both series, as it has been as

a rule in the milder form of scarlet fever, which has been prevalent. It occurred only in about one-half of 1 per cent in both series, with a fractional difference in favour of the serum.

Endocarditis occurred in four cases without serum, and in only one after serum. Arthritis occurred in $3\frac{1}{2}$ per cent of our cases without serum and in 2 per cent with serum, no serum case going on to suppuration.

To sum up this side of the question it is obvious that serum even given early will not prevent complications, but that it reduces the incidence of these at least one-half, and makes them much milder.

Next comes the most important question of all, as to the effect on the mortality of the disease. I have heard it soberly stated by an observer of experience that while serum relieved the toxæmia of the first week of the disease, it did not appreciably lower the mortality, which was chiefly due to complications. This is of course manifestly absurd. Any treatment which will improve the condition of the patient even temporarily, is certain to turn the scale in doubtful cases in favour of recovery.

It is a little difficult, however, to decide this point from statistics, because everywhere it is recognized that the percentage mortality of scarlet fever has been falling in recent years, and the type of the disease becoming milder. In the Alexandra Hospital the mortality of scarlet fever always used to be over 5 per cent. In 1923 it was 3.25 per cent and in 1924 (using blood-serum of convalescents in serious cases) it was 2 per cent. Since the general use of scarlet fever antitoxin there have been 800 cases with ten deaths or only 1.2 per cent. Of these ten, no one died of scarlet fever alone but all of the ten died of some accidentally concurrent disease. Thus two died of burns which preceded the scarlet fever; two died of appendicitis with peritonitis; two of pneumonia, one of empyema; one, an infant died suddenly from some unknown cause, and two died of septicæmia following scarlet fever, having had no serum within the first eight days of the disease. I have yet to see a straight case of scarlet fever which has received an average dose of serum within the first three days die of the disease. It is true that our cases were mostly mild but at least forty of the 800 cases, or 5 per cent would be classified as severe scarlet fever. I

do not believe the above statement can be made of the specific treatment of any other acute disease.

As to any ill-effects caused by the use of serum; it is a horse-serum, and the effects of it are exactly similar to those met with after the use of diphtheria or tetanus antitoxin, no better, and no worse. In other words since we have begun the use of properly prepared concentrated serum globulin, to be always given with due precautions, any ill-effects may be regarded as negligible, especially in children. Serum sickness will occur in a certain percentage of cases, and is particularly annoying in the case of adults. In my series no death could be ascribed to the serum, but 13 per cent had a serum rash in some form.

Finally, as to the value of this serum as a prophylactic, i.e., the value of the administration of a small dose to contacts for immediate protection, I have notes of 250 non-immune individuals who were given a prophylactic dose immediately after exposure to the contagion of scarlet fever, using 2.5 c.c. of concentrated serum as a dose for adults and 1 c.c. for infants. Of these only two developed the disease within two weeks; of eight separate outbreaks of scarlet fever in institutions or large families all were immediately arrested by the use of serum. Perhaps the most striking instance was in the Montreal Foundling and Baby Hospital, where three cases of scarlet fever occurred simultaneously from some unknown source. Eighty-five of the inmates were given serum and no one developed the disease; four were omitted for various reasons, and of these two developed scarlet fever within a week; there were no further cases.

On the other hand the immunity conferred cannot be relied on for more than two weeks, if the person remains exposed to infection, for I have notes of fifteen persons developing scarlet fever, to whom serum had been given more than two weeks previously, and who remained exposed to subsequent infection. In other words, if a scarlet fever case is kept in a home and cannot be absolutely isolated, the rest of the family cannot be protected by the use of serum alone unless it is repeated every two weeks.

The question is often raised as to whether the use of serum should shorten the quarantine for the disease. I see no reason why quarantine should be shortened in the case of scarlet fever

any more than the official quarantine of diphtheria is shortened by the use of serum. The only exception is that there are fewer prolonged cases with septic discharges so that the average quarantine is shorter.

Summary

In scarlet fever antitoxin we have a specific remedy which cuts short the disease and relieves all of its early manifestations; it lessens the number and severity of the complications and definitely lowers the mortality of the disease.

From this it follows that anti-scarlatinal serum should be administered to every case of scarlet fever at the earliest possible moment, regulating the amount of the serum according to the severity of the attack and repeating the dose promptly if the first dose proves inadequate.

Finally the general use of the serum should rob the disease of all its terrors and scarlet fever should be added to the ever-lengthening list of diseases conquered in the progress of medical science.

THE RELATIVE VALUE OF DIFFERENT TUBERCULIN SKIN TESTS*

By F. F. TISDALL AND ALAN BROWN

From the Hospital for Sick Children, Toronto

THE results of tuberculin skin tests performed on 203 patients, admitted to the Hospital for Sick Children during the past three years, who either gave positive reactions or suffered from advanced tuberculosis, have been analysed in an attempt to determine: first, the value of both human and bovine tuberculin; second, the relative value of the intracutaneous and von Pirquet tests; and third, the diagnostic value of a high concentration of tuberculin in patients with advanced tuberculosis.

Human and bovine tuberculin.—159 patients were tested intracutaneously with human and bovine tuberculin. The exact method of preparation of the tuberculin was as follows. One c.c. of Mulford's old tuberculin (human or bovine) was diluted with 39 c.c. of 0.4 per cent carbolic acid in normal saline. This made a 1 in 40 dilution of old tuberculin which was kept on ice and used as a stock solution. To 1 c.c. of this dilution was added 9 c.c. of the 0.4 per cent carbolic acid solution. This made a 1 in 400 dilution of old tuberculin which was kept on ice and used for only one month. Of this dilution 0.1 c.c. (0.25 mg. old tuberculin) was injected intracutaneously on the anterior surface of the forearm about two inches below the

elbow. No general or severe local reactions were observed. Only three, or 1.8 per cent, of the 159 patients reacted negatively to bovine and positively to human tuberculin, while none reacted positively to bovine and negatively to human tuberculin.

One hundred and thirty-eight patients were tested by von Pirquet's method with both human and bovine tuberculin. The exact procedure utilized was as follows. The anterior surface of the forearm was sterilized with alcohol and a drop of old tuberculin placed on the skin about two inches below the elbow. With an ordinary sterile needle a scratch one-half inch long was made through the drop of tuberculin. The scratch was made as deeply as possible without drawing blood. The tuberculin was then rubbed into the scratch with the needle and allowed to dry. Three, or 2.1 per cent, of the 138 patients reacted negatively to bovine and positively to human tuberculin. These three patients were also tested intracutaneously and reacted positively to both human and bovine tuberculin. In no instance did a patient react negatively to human and positively to bovine tuberculin.

In 1908 Detre¹ first suggested the use of both bovine and human tuberculin tests in the belief that each type of infecting organism produced a specific reaction. Since then numerous articles

* Read at the fourth Annual Meeting of the Canadian Society for the Study of Diseases of Children, Gananoque, June, 1926.

have appeared with results in support of this theory. It is not our intention to review this literature. Many of the references may be obtained from articles by Synwoldt² in 1920, Nehring³ in 1923 and from a recent report by Downing and Higgins⁴ in 1926. All the authors in a varying percentage of cases, in some instances over 50 per cent, obtained reactions with one tuberculin and not with the other. Downing and Higgins in their series of tuberculous patients found that if both tuberculins had not been used, the missed cases would have amounted to 15 per cent of the total.

On the other hand experiments have been reported by Weber and Dieterlen⁵, Schuster⁶ and others in which animals injected with one type of tubercle bacilli react in a few weeks to both human and bovine tuberculin. This whole problem of a specific tuberculin reaction has been investigated at some length, and the opinion held at present by most workers is expressed by the authoritative statement of Calmette.⁷

"In reality there is no difference between tuberculins prepared with bovine bacilli and those obtained with human bacilli. The ideas advanced some years ago by Detre and his pupil V. Gebhardt, relative to the possibility of diagnosing the human or bovine origin of a tuberculous infection in man by the differences of reaction between human or bovine tuberculins were based on errors of observation and have since been abandoned."⁸

This, however, does not explain the discrepancy between our results and those of Downing and Higgins (of Cincinnati) and others. If Calmette's statement of the absence of a specific tuberculin reaction is disregarded an obvious explanation of the divergent results obtained is the one advanced by Kretschmer⁹ and others who believed that the purity of the milk supply was the dominant factor. This does not explain the difference between the Cincinnati and Toronto results as the total milk supply of both Cincinnati and Toronto is pasteurized or certified. No doubt a certain percentage of the

patients under discussion were admitted to hospital from outside Cincinnati and Toronto; but as Toronto is the paediatric centre for a population of two and a half millions and the population of the city itself is only three quarters of a million, the percentage of rural patients is probably just as great or greater in Toronto than in Cincinnati. There is no evidence that the milk supply is a factor in the different results obtained.

The explanation might be offered that in the early stages of the disease a specific tuberculin reaction to one type of tubercle bacilli might be present, which later develops with a group reaction to both types of organisms. On our series of 203 patients, fifty-two, or 25.6 per cent, were diagnosed mediastinal tuberculosis only, which is one of the earliest stages of the disease which can be recognized clinically. Of these fifty-two patients, two reacted to human tuberculin and not to the other. The difference between our results and those of Downing and Higgins and others cannot be explained on this assumption.

It is necessary here to discuss for a moment just exactly what the tuberculin test signifies. A positive tuberculin reaction means that the individual is sensitive to tuberculin. The sensitization is developed as the result of an implantation of the tubercle bacilli in the patient. The degree of sensitization is entirely individual. It bears no necessary relationship to the severity or duration of the infection and it is often necessary before excluding tuberculin sensitization to use an amount of tuberculin greater than would ordinarily be used as a routine measure.

There are no very satisfactory methods for the standardization of tuberculin so that no two batches of old tuberculin, human or bovine, are of exactly the same strength even when made by the same laboratory.⁹ Kretschmer⁹ found a marked difference in the strength of tuberculin produced by different manufacturers. The whole question has been recently investigated by Watson.¹⁰ His observations are most enlightening. He states "Tuberculin is easily obtainable, either from State Institutions or through commercial houses, and when it reaches the hands of the physician or veterinarian, it is usually assumed that it is a properly standardized product."....."It may be stated here

⁸ En réalité il n'y a aucune différence entre les tuberculines préparées avec des bacilles bovins et celles obtenues en partant de bacilles de provenance humaine. Les idées émises il y a quelques années par Detre et son élève V. Gebhardt, relativement à la possibilité de diagnostiquer l'origine humaine ou bovine d'une infection tuberculeuse chez l'homme par les différences de réaction vis-à-vis des tuberculines humaines ou bovines, reposaient sur des erreurs d'observation et sont abandonnées aujourd'hui.

that several samples of tuberculin of different manufacture, purchased in Canada, have recently been tested and were found to be far below standard strength and of very questionable value". . . . "Eighteen different tuberculins of commerce varied from 0 to 3200 units per c.c. of the original sample, or, according to the contents of Koch's Old Tuberculin per c.c., as printed on the labels, 0 to 6000 units. Three of these tuberculins did not produce any reaction and appeared to be quite inert. Six samples showed only a slight antigenic activity, three were fairly active but below standard, one was equivalent to the standard; three were slightly over and two very much in excess of this."

It is also known that the strength of a dilute solution of tuberculin diminishes rapidly. Also many of the older reports were based on the von Pirquet test which we will show is not nearly as reliable as the intracutaneous test.

We, therefore, believe that the fact that positive reactions have been obtained with one tuberculin and negative reactions with the other is due to a difference in the amount or potency of the tuberculin injected. As evidence in favour of this in our series, the three patients who reacted negatively to bovine and positive to human tuberculin by the von Pirquet test reacted positively to both by the intracutaneous test. Also one patient who has been included as reacting to both tuberculins, reacted negatively at first to the bovine; but on repeating the test in two days gave a positive reaction. Unfortunately the test was not repeated in our three cases classified as reacting positively to human and negatively to bovine by the intracutaneous method.

We suggest that if Downing and Higgins took adequate measures to prevent the use of deteriorated tuberculin, a larger amount than 0.1 milligram of old tuberculin (Parke and Davis) as advocated by them should be used as a routine procedure in the intracutaneous test with children. We further suggest that in future investigations of the problem, the test should be repeated in all cases where a negative reaction is obtained with one tuberculin only.

Because of a lack of satisfactory standardization of tuberculin the relative size of the reactions obtained by the two tuberculins is of no value.³ The relative size in our series was noted in sixty-four cases and found to be the

same size in forty-nine, the human tuberculin larger in twelve, and the bovine in three.

No control tests were done in either our cases or those of Downing and Higgins. The control test of injecting ordinary broth is so rarely positive that it has been largely discarded. An investigation at present in progress by the Wentworth (Ontario) County Survey shows that approximately 2 per cent of patients give a positive reaction when tested with a special glycerine broth treated in an identical fashion as though tubercle bacilli had been grown in it. Such results would ordinarily be interpreted as mildly positive tuberculin reactions. This is a very small percentage of cases and has no practical bearing on our results.

The relative value of the intracutaneous and von Pirquet test.—Wahl and Gerstenberger¹¹ and others found the intracutaneous test more sensitive than the von Pirquet test as ordinarily performed. Our results coincide with this observation. It must be remembered that the percentage of tuberculin absorbed from the von Pirquet test is very small as compared with the percentage absorbed from the intracutaneous test. Ten cubic millimeters of a 50 per cent solution of old tuberculin, when used with the von Pirquet test, will produce the same degree of reaction as 1/20 cubic millimeter when injected intracutaneously.⁹ One hundred and seventy-seven tuberculous patients were tested with both the intracutaneous and von Pirquet test using human tuberculin. The routine amount of old tuberculin (0.25 mg.) was used for all the intracutaneous tests. Twenty-seven patients or 15.3 per cent, gave negative reactions, while with the von Pirquet test no less than seventy-four patients or 41.9 per cent, reacted negatively.

The value of a high concentration of tuberculin in tuberculin skin tests in patients with advanced tuberculosis.—It has long been recognized that the degree of concentration may be markedly reduced in the presence of an overwhelming tuberculous infection. We obtained a negative reaction in thirty patients all of whom suffered from advanced tuberculosis. The diagnoses were as follows: tuberculous meningitis twenty-one cases, miliary tuberculosis three cases, tuberculous pleurisy two cases, tuberculosis of the lungs one case, tuberculosis of the kidneys one case, tuberculous peritonitis one case

and tuberculous mediastinal abscess one case.

It has been emphasized by Happ and Casparis¹² that a positive reaction will be obtained in these patients if a high enough concentration of tuberculin is used. Twelve of our patients who gave a negative reaction with the 0.25 mg. of old tuberculin were given between 1.25 and 2.5 mgs. of old tuberculin (0.05 to 0.1 c.c. of a 1 in 40 dilution of old tuberculin). Ten of these reacted positively to the stronger dilution. Our results therefore, confirm those reported by Happ and Casparis.

Control tests with the higher concentration of tuberculin were done on forty-one infants under eighteen months of age and on forty-four children from eighteen months to fourteen years of age. These patients all had reacted negatively with the 1 in 400 dilution. In only one instance was a positive reaction obtained with the higher concentration. This patient was four years of age. A diagnosis of tuberculosis had just been made on the mother who had not been well for the previous three months. It is possible that this patient had recently been infected with tuberculosis from the mother and had not as yet developed the usual degree of sensitization.

Summary

1. The results of tuberculin skin tests performed on 203 patients, admitted to the Hospital for Sick Children during the past three years, who either gave positive reactions or suffered from advanced tuberculosis, have been analyzed.

2. One hundred and fifty-nine patients were tested intracutaneously with both human and bovine tuberculin. Of each type of old tuberculin 0.25 mg. was injected. Only three patients, or 1.8 per cent, reacted negatively to bovine and positively to human tuberculin while none reacted positively to bovine and negatively to human tuberculin.

3. One hundred and thirty-eight patients were tested by von Pirquet's method with both human and bovine tuberculin. Three, or 2.1 per cent, of the 138 patients reacted negatively to bovine and positively to human tuberculin. These three patients were also tested intracutaneously and reacted positively to both human and bovine tuberculin. In no instance did a patient react positively to bovine and negatively to human tuberculin.

4. One hundred and seventy-seven patients

were tested with both the intracutaneous and von Pirquet test using human tuberculin. The routine amount of old tuberculin (0.25 mg.) was used for all the intracutaneous tests. Of these, twenty-seven patients, or 15.3 per cent, gave negative reactions while with the von Pirquet test no less than seventy-four patients, or 41.9 per cent, reacted negatively.

5. Twelve patients with advanced tuberculosis who gave a negative reaction with 0.25 mg. of old tuberculin were given between 1.25 and 2.5 mg. of old tuberculin. Ten of these patients reacted positively to the increased amount of tuberculin.

Conclusions

An infant or child who is sensitive to tuberculin will react positively to both the bovine and human tuberculin even in the early stages of the disease. It is, therefore, impossible to determine the type of infecting organism by the tuberculin reaction. The results of Downing and Higgins and others are at variance with this conclusion. On account of the difficulty in standardizing the strength of tuberculin preparations, we believe that the fact that Downing and Higgins obtained reactions with one type of tuberculin and not with the other is due to a difference in the potency of the tuberculins used. From our results it would appear that this difficulty can be overcome by giving a larger amount of commercial tuberculin (0.25 mg.) as a routine procedure, which thus insures the injection of a potent amount in practically every case.

The intracutaneous tuberculin test is infinitely more sensitive than the von Pirquet test, as ordinarily performed.

Patients with advanced tuberculosis who do not react to the usual amount (0.25 mg.) of tuberculin will give a positive reaction in many instances when a larger amount (2.5 mg.) is used.

ADDENDUM

In a personal communication the Chief of Bureau of Animal Industry, United States Department of Agriculture, Washington, D.C., states that his department has used since about the year 1891 the human type of tubercle bacillus in the preparation of tuberculin for the diagnosis of bovine tuberculosis and that over this whole period of time the results have been quite satisfactory.

REFERENCES

- (1) DETRE, *Wien. klin. Wchnschr.*, 1908, 21-173
- (2) SYNWOLDT, I., *Deutsch. med. Wchnschr.*, 1920, 46

455. (3) NEHRING, E., *Ztschr. f. Tuberculose*, 1923, 38-182. (4) DOWNING, H. F. AND HIGGINS, H. L., *Am. Jour. Dis. Child.*, 1926, 31-178. (5) WEBER AND DIETERLEN, *Compt. rend. Soc. de biol.*, 1908, 64-501; 1909, 66-206. (6) SCHUSTER, D. *Deutsch. med. Wchnschr.*, 1920, 46-1102. (7) CALMETTE, A., *L'Infection Bacillaire et la Tuberculose*, page 86, Masson et Cie., Paris, 1920. (8) KRETSCHMER, *Deutsch. med. Wchnschr.*, 1921, 47-465. (9) CAULFEILD, A. H. W., Personal communication. (10) WATSON, E. A., Canadian Tuberculosis Association, 24th Annual Report, 1924, 90. (11) WAHL, S. A. AND GERSTENBERGER, H. J., *Arch. of Ped.*, 1923, 40-143. (12) HAPP, W. M. AND CASPARIS, H. R., *Am. Jour. Dis. Child.*, 1922, 23-527.

URETERAL STRICTURE*

A CAUSE OF OBSCURE ABDOMINAL AND PELVIC PAIN

BY WALTER P. HOGARTH, M.B. (TOR.)

Fort William

URETERAL stricture, an obstruction in the lumen of the ureter, interfering with the passage of urine from the kidney to the bladder, is a condition which receives little attention in even the newer works on urology, gynecology and abdominal surgery. It is seldom even mentioned in the differential diagnosis of abdominal or pelvic pain.

It is only recently, due principally to the writings, based on thorough investigation, of Professor Hunner of Johns Hopkins Hospital, that physicians generally, and those doing urological and gynecological work in particular, are beginning to realize that ureteral stricture is one of the more common lesions giving rise to abdominal pain, and is the explanation of many hitherto unsolved problems.

Nearly all of us have performed or indicated operations for chronic appendicitis or gall bladder disease, only to find that after an interval after operation, the old pain has returned. Persistent pain after operation on the female pelvis is not always explainable by the possible presence of adhesions. We are often at a loss for a satisfactory explanation of pyelitis, even that of pregnancy, or for the dysmenorrhea which childbirth fails to cure. Many times in our examinations of patients our attention has been directed to the urinary tract by pain and remote bladder symptoms, but as nothing more than an occasional leucocyte was found in the urine, and as the x-ray report was negative for stone, the urinary tract as a source of the trouble has been dismissed from our mind. The

patient may have been directed to have a cystoscopic examination, and after ureteral catheterization and study a report has been returned from the urologist that no pathology was found, yet the patient has been improved. Why? because the passage of the ureteral catheter had dilated the ureter sufficiently to improve drainage and give relief. Such findings may give rise to considerable worry until an explanation has been found.

The diagnosis of ureteral stricture, as I hope to point out, can generally be made clinically with a very fair degree of accuracy, but has not been made more often, because it has not been suspected or appreciated. It may be asked why, if the condition is so prevalent, have the urologists not been drawing our attention to it? The answer appears to be that very few patients are sent to the urologist, until they have very definite bladder symptoms with serious lesions, which are often found to be the result of a neglected stricture. While the final diagnosis and the treatment must perforce rest with the man familiar with urological technique, still it is the man doing general work who has the first and often the only opportunity to see these cases, and who, with this condition in mind, will direct many more to have appropriate treatment.

Some ureteral strictures are congenital; others are acquired as the result of trauma, either the result of external injury, or as the result of injury during the passage of a calculus. The very small ureteral orifice, I feel, should really be classed as a congenital stricture, because it will give rise to the same symptoms as a stricture, and is relieved by the same treatment.

* Read before the annual meeting of the Ontario Medical Association, London, May 28, 1926.

The great majority of ureteral strictures, however, are due to inflammatory conditions in the ureteral walls which have resulted in a narrowing of the lumen.

It is impossible in the time at my disposal to discuss the whole question of ureteral stricture, so my remarks will be confined to the latter condition, namely those due to inflammatory changes in the ureteral walls.

Hunner claims that practically all of these cases are due to focal infection. This seems reasonable, because most of the lesions are located in very close proximity to lymph glands; also because active foci of infection can generally be located, the eradication of which aids materially in the treatment of the stricture. A striking feature of the history of these cases is the occurrence of periods of complete freedom from pain, followed by severe attacks of pain, sometimes even renal colic, in probably a few hours. The reasonable explanation seems that some occurrence has stirred up fresh inflammatory reactions in an already damaged area, such as exposure, chilling, wet feet, fatigue, premenstrual congestion or an acute infection such as tonsillitis or sinusitis. Attacks may also be set up by inflammation in neighbouring organs such as appendicitis, salpingitis or even by the pressure of a pregnant uterus or a cystic ovary. The most frequent foci of infection are the teeth, tonsils and sinuses; the cervix, prostate and seminal vesicles are also fairly frequent sources; in more remote cases, the gastro-intestinal tract should be investigated. Many patients give evidence of bilateral discomfort, in such cases the condition is nearly always found to be bilateral.

The most frequent location of strictures is in that portion of the ureter which is in close relation to the broad ligament—that is the region between two and five centimeters from the ureteral orifice. Persistent pain after pelvic operations should bring to mind the fact that infection may have spread from a pus tube nearby.

Ureteral stricture causes that partial obstruction to the flow of urine, which has long been recognized to result in back pressure and stasis. Stasis of urine is known to be a very definite cause of infection in the urinary tract as witness the effects of residual urine due to an enlarged prostate. This back pressure results

in tension in the ureter above the lesion and in the pelvis of the kidney. If this pressure persists long enough there is dilatation of the ureter and renal pelvis. This is an explanation for the small, painful hydronephrosis so often seen. Does not this combination of back pressure with resultant dilatation, and stasis with infection, explain a good many of our cases of pyelitis, pyonephrosis and even of calculi? Improved drainage alone, according to some writers, will clear up chronic pyelitis. I have found that dilatation and lavage give better results than lavage alone; still I feel, following the teaching of Kidd, that lavage is indicated. I have recently seen a case of ptosed kidney with a history of repeated attacks of pain. The pelvis held 18 c.c. and was opposite the umbilicus; a stricture was present 3 cm. above the ureteral orifice, with a dilated condition above. Dilatation relieved the pain. It seems reasonable to state that in this case pain was not due to the floating kidney but to interference with proper drainage due to the stricture. This should be a fruitful condition for investigation.

It was formerly felt that ureteral stricture was another "female complaint" especially as the early writers on the subject were gynaecologists; but as the condition become more generally recognized, it is being found almost as frequently in the male as in the female.

Some of the striking facts noticed in the histories are; the duration and periodicity of symptoms, the variability of diagnosis, and the number of operations performed or recommended. One of my patients in this series could trace her trouble back thirty years, during which time she had consulted many physicians in three different countries and had been operated upon twice without relief. Nearly every patient I have seen has been operated upon or has had surgery recommended.

The usual type history is: for many years there have been repeated attacks of pain, in either the lower or upper abdomen accompanied by some slight disturbance of urination. These attacks are always associated with some of the conditions mentioned above, such as exposure, tonsillitis, etc. There are also vague symptoms of renal tension, such as digestive disturbances or slight temperature. After a few days in bed, or a hypodermic injection of morphine and atropine there ensues a period of comfort. The

attacks have gradually become more frequent and severe. Another type history is that of a woman who complains at first of pelvic and back pain for a day or so before the menstrual period, then, as the trouble progresses, pain is present throughout the period, then almost continually with exacerbations before the period. This dysmenorrhea is not relieved by childbirth but gradually grows worse.

The symptoms of ureteral stricture are abdominal or pelvic pain associated with disturbances of urination and the remote symptoms of renal pelvic tension such as, nausea, restlessness, flatulence, backache, loss of weight and appetite.

Pain is present in practically every case. At intervals, it may be absent but usually the patient is constantly aware of a tender area in the lower abdomen. Pain is felt acutely at the site of the lesion and also in the area related to the pelvis of the kidney. Pain at the site of the lesion, usually in the lower abdomen, varies from a dull toothache-like pain to sharp cramp-like pains which are referred to the groin and down the inner side of the thigh. On palpation, there is an absence of the spasm of a peritoneal infection, but the tender area can be very definitely localized. This area is too low for an appendix, too high for a tube, and closer to the mid line than either. Further, on palpation this tenderness is found to extend up the abdomen along the line of the ureter. On bimanual examination a tender area corresponding to the lower end of the ureter can be felt but no mass. Pain is also often felt over the sacro-iliac articulation. If we remember that the course of the ureter lies over the anterior surface of this articulation its involvement can be readily understood. In this case the pain is referred down the posterior surface of the thigh. There is also pain in the loin when the obstruction has persisted long enough to give rise to tension in the pelvis. In this case the intensity may vary from mere soreness or backache to attacks of colic. The patient usually complains of deep soreness in the upper part of the abdomen. On the right side this pain is easily mistaken for the pain of a gall bladder condition or the referred pain from a chronic appendix, but the point of maximum pain is distant from these other organs, too low for a gall bladder and too high for an appendix. Palpation reveals no spasm but a deep tender-

ness which is found to be associated with the kidney, and which may be followed down the line of the ureter.

There is also tenderness in the costo-muscular angle, when the pelvis is under tension.

The urinary symptoms depend on the degree of infection present. At first there is only frequency of urination during an attack of pain or a tingling or slight distress during urination. As infection is added we can obtain a history of all degrees of pain and frequency even to strangury, hematuria and occasionally incontinence. Hunner in an analysis of a hundred consecutive cases found that 20 per cent showed evidence of pyelitis, pyonephrosis, or infected hydronephrosis. The urine was absolutely negative in about 30 per cent. In the remaining 50 per cent were found a few leucocytes, a few erythrocytes, a few casts, a trace of albumen or a combination of two or more of these evidences of some pathological condition in the urinary tract. So the urinary findings in themselves are not typical; there can be any degree or kind of infection present. When there are even the slightest urinary symptoms along with pain in the abdomen, ureteral stricture should be considered.

Diagnosis is confirmed by cystoscopy and pyelography. The cystoscopic appearance of the bladder depends on the degree of infection present. In cases without much infection there is a slight trigonitis or some oedema around the orifice of the ureter. In many cases the bladder has a normal appearance with very small ureteral orifices. The cystoscopic examination should never be completed without examining the ureters. The ordinary ureteral catheter will often reveal the obstruction, but this is not enough for a diagnosis. Hunner, who uses the Kelly air cystoscope uses a wax bulb on a catheter and with this can feel the hang of the bulb on the stricture during withdrawal, in the same way that a urethral stricture will hold up a bulb. For those of us who use a water media cystoscope this procedure is not so easy, although the bulb may be inserted into the bladder and then threaded into the cystoscope backwards. While we may often feel the obstruction we must depend mainly on the uretero-pyelogram.

The ureterogram will show a dilated ureter above the point of obstruction and a definite

narrowing at the stricture point. The stricture may be single or multiple. The pelvis of the kidney is usually dilated to a greater or less degree. Some authorities claim that this obstruction felt is not due to a lesion but that it is due to spasm of the ureter brought on by manipulation. This however, does not explain the constancy of the findings of obstruction and dilatation.

Treatment consists in over-dilating all strictures found. Both ureters should be widely dilated, in some cases as much as F16 is required. Dilatation may be done by bulbs on catheters or by dilating bougies. I have found that using multiple catheters of different sizes followed by metal bougies to be very satisfactory. Dilatation is done gradually at treatments ten to fourteen days apart. Prompt removals of the focus of infection is also necessary to secure the best results.

An exacerbation of the symptoms often occurs for a few days after the first dilatation. The explanation is that the dilatation has not been carried far enough to prevent the resulting œdema from partially closing off the ureter. Some writers go so far as to say that a severe reaction after ureteral catheterization is in itself diagnostic of ureteral stricture.

Illustrative Cases

Mrs. M. Pain in the left loin for fifteen months; no urinary disturbance. Small ureteral orifice with dilated ureter. Orifice dilated twice, pain disappeared. Has had a baby since with no recurrence of the pain or sign of urinary disturbance.

Mrs. H. Pain in the lower left side of the abdomen for many years. This pain was of a cramp like nature. There would be intervals of complete freedom from pain followed by severe attacks. During the attacks she complained that the bladder was very irritable. Had been recommended to have the left ovary removed. The urine was sterile. Stricture 2 cm. from the orifice; this was dilated and there has been no recurrence of pain.

Mrs. S. In 1922 double salpingectomy for G.C. infection; 1923, large right ovarian cyst removed. One year later began to complain of pain in the lower right side of the abdomen, this was relieved by rest in bed and sedatives. Attacks recurred every two to three weeks and the pain was gradually felt in the upper abdomen and back. While at a theatre one night she had an attack which was diagnosed as renal colic. An x-ray was negative to calculi. Cystoscopy showed slight trigonitis, also some œdema around the right orifice. A stricture was found 4 cm. from the orifice this was dilated and there has been no return of the pain.

Mr. H. Had passed a calculus several years previously. Had been having attacks of renal colic for

three days when seen. Morphine was necessary for the pain. There was a constant desire to urinate. No hæmaturia. An x-ray was negative to stone. A stricture was found 3 inches below the pelvis of the kidney. This was dilated. He left the hospital the next day free from pain. He has had further dilatation and has been free from pain for over a year.

Mrs. M. A persistent painful area in the abdomen to the right of the umbilicus; no abdominal spasm; gastro intestinal series negative; urine showed only an occasional pus cell. Cystoscopy showed some trigonitis with œdema around the orifices which were very small. Stricture found 3 cm. from the orifice, pelvis held 18 c.c. The pyelogram showed a ptosed kidney lying directly opposite the umbilicus corresponding directly to the site of pain. The ureter was dilated down to the point of obstruction. Dilatation relieved the pain.

Mr. R. Recurrent attacks of pain in the right side for several years. Appendectomy for a chronic appendicitis was performed three years ago, with as a result freedom from pain for a few months, after which it returned. He gradually became a nervous wreck. At a large clinic, he was told that his trouble was due to a chronic prostatitis. After this was cleared up the pain still persisted, although his general condition was better. Cystoscopy revealed a stricture 2 cm. from the orifice, this was dilated. This was followed by an exaggeration of the symptoms for a few days. Subsequent dilatations have resulted in the disappearance of the pain.

Mr. H. Reported with a urethral discharge and tingling during urination. No history of infection. Found to have a chronic prostatitis, this was treated, but the tingling still persisted. A stricture was found near the pelvis and after dilatation the tingling disappeared.

Mrs. N. Since she was sixteen has had repeated attacks of pain in the right side of abdomen and the loin. This pain was of a dull character at first, but as the attacks recurred they became more severe. Appendectomy and suspension of uterus in 1920; in 1923 the gall bladder was examined but being found negative was not removed. The pain continued, morphine was necessary during some of the attacks. She was found to have very small ureteral orifices with bilateral stricture 3 cm. above the orifices. At the first sitting the right side was dilated, this was followed by the first attack of pain that she had had on the left side. Subsequent dilatations have been followed by no reaction. She told me the other day that she had never enjoyed better health.

Conclusions

1. Ureteral stricture due to inflammatory reactions is a definite clinical entity.
2. Abdominal and pelvic pain particularly when associated with urinary disturbances are commonly caused by ureteral stricture.
3. Ureteral stricture is common to both male and female.
4. The condition is usually bilateral and due to focal infection.
5. The relief from pain which the patient receives from dilatation is the best proof that the condition has been correctly diagnosed.

CHOICE OF THE ANÆSTHETIC*

By W. WEBSTER, M.D.

Chief Anæsthetist, Winnipeg General Hospital

IN selecting the anæsthetic for the individual patient and operation, one is influenced by many considerations: age, sex, muscular development, condition of the heart, lungs, liver, and kidneys, also the site of the operation, whether on the brain, abdomen or elsewhere. The anæsthetist of to-day has at his disposal a number of anæsthetics from which he may select the one most suitable for a given case or operation. He has also a variety of methods of administration, and we must look upon the practice of using one anæsthetic in a routine way as belonging to a bygone time. To obtain the greatest success we must vary our anæsthetic, and the method of its administration to suit the case in hand. There are not wanting, however, some who use a single anæsthetic for all purposes claiming, in the case of nitrous oxide for example, that they obtain the best possible results by this method. Doubtless by this narrowing down and concentration on one anæsthetic they become singularly adept in its administration. The best ultimate result, however, the object for which we are all striving appears to come from an intelligent selection and skilful use of the several tried and well known anæsthetics.

It is a popular fallacy to believe that those in good health, with good muscular development, are the best risks for anæsthesia. This is not invariably the case. Of course, as against those with serious organic disease of the heart, lungs, or kidneys, they are much safer risks; but when these are absent, one usually finds that the weaker, asthenic subjects, who have lain in bed for some time, prove easier and safer cases for anæsthesia. A greater depth of anæsthesia is usually required for the former than the latter type, and a far larger quantity of the anæsthetic must be inhaled to produce the requisite degree of relaxation, and to prevent any inconvenient reflex movements. The latter type may remain passive to surgical procedures even when the lid and corneal reflexes are fairly active. At the

same time they will not hold out against a given strain as long as a stronger person.

When untoward symptoms appear during the course of anæsthesia, the cause of these, and their remedy, is the important problem with the anæsthetist, and the one with which he must be able and ready to cope immediately. The quickness with which any slight variation from the normal is noted is one mark which distinguishes the skilled anæsthetist from the mere tyro.

The degree of confidence which the patient reposes in the anæsthetist, which varies much with the personality of the latter, is of the utmost importance. It tends, along with skill in administration, to prevent the period of excitement and consequent struggling which is happily much less seen now than in the past. Any struggling, especially of a violent nature, represents a serious loss of the patient's energy. An excessive strain is thrown on one, possibly already weakened by some intercurrent disease, or who may be suffering from an impaired cardiovascular system. There is danger of losing sight of the fact that overexertion, or severe effort sustained over even a short period of time by the conscious or semiconscious subject, is sometimes followed by acute cardiac distress or syncope. Violent struggling may therefore be the cause of sudden death following operation, or of gradual cardiac failure during the post-operative period. At the best it usually leads to a poorer type of anæsthesia throughout the operation, owing to some subconscious remembrance of the period of excitement.

Anæsthesia in Thyroidectomy Goitre.—The condition here varies greatly, all the way from a simple adenomatous enlargement to a severe toxic condition, with exophthalmos, and heart and nervous symptoms. The patient may suffer from severe pressure on the trachea. The trachea may be narrowed from before backward, or laterally according to the direction of the pressure. If the pressure is principally on one side, one usually gets also a displacement of the trachea, which may be pushed over in a variable degree to the opposite side. Owing to this pres-

* Delivered at the meeting of the Ontario Medical Association, May 27, 1926.

sure the wall of the trachea may be thinned considerably, the rings in some instances may have almost disappeared from pressure atrophy. This condition brings us face to face with two possibilities of trouble: the trachea may collapse on removal of the gland and so cause closure, partial or complete, of the airway; or in the surgeon's effort to separate the gland, the trachea may be torn open. Either is an exceedingly undesirable complication. Our choice of anæsthetic is, therefore, controlled by various factors. Many advocate following Crile who uses nitrous oxide-oxygen together with local anæsthesia; an admirable combination in many respects. However, after considerable trial of this combination of nitrous oxide-oxygen with local anæsthesia and without it, the author has found that in nearly all subjects, the quantity of nitrous oxide is not lessened by the addition of the local anæsthetic. It is seldom necessary in either case to abolish the lid and corneal reflex. The theory that the local anæsthetic is required to cut out the transmission of impulses to the brain does not seem to be proved, for it has recently been shown, by extremely delicate galvanometric experiments, that impulses from a site of operation are only transmitted along a nerve to the first synapse, when the subject is in a condition of surgical anæsthesia. The lighter stages of anæsthesia were not quite so effective in this respect. It has been shown also by numerous workers that similar changes in the cortical cells occur from anæsthesia alone, without the stimulation of operation; also from fear and excitement. Against its use is the time lost while injecting the parts, and the slight œdema of tissues, which makes for further loss of time with those unaccustomed to work with injected tissues.

The ether-oil colonic method may be used, and has the merit of keeping the anæsthetist completely removed from the surgical field.

Intratracheal insufflation, either by ether or chloroform, has been also frequently used and has the same advantage of allowing the anæsthetist to sit at some distance from the site of operation. The anæsthetic can be controlled between very narrow limits, and usually kept as light as with nitrous oxide-oxygen; for the mechanical nature of the respiration appears of itself to have a slight hypnotic effect. There is a possible danger, though extremely remote, that in introducing the catheter into the trachea per-

foration might occur, when the wall is very thin from atrophy, and more so if it is also displaced, so that the catheter, instead of following a straight course, has to be bent by pressure against the tracheal wall. In many cases one of the vaporizing inhalers with an oxygen tank attached instead of the usual motor or bellows, so as to supply oxygen along with the ether, gives excellent results. The question of expense, or absence of the necessary machine sometimes prevents the use of nitrous oxide.

Obstruction to respiration may be occasioned by other external and internal growths. In some cases it may even be necessary to do a preliminary tracheotomy and to give the anæsthetic through the tracheotomy tube. The latter is no difficult matter, the anæsthetic tube from one of the various vaporizing machines or nitrous oxide-oxygen inhalers being inserted into the tracheotomy tube; or the Trendelenburg apparatus may be used if it is desired to give chloroform or ether by this method.

When the respiration is wholly thoracic, or wholly abdominal, as is sometimes the case, the former when the abdomen is greatly distended, or the muscles held rigid as in severe ascites, intestinal obstruction, peritonitis, and ovarian disease; the latter in advanced emphysema or other disease of the lungs or pleura particular care must be exercised over both the respiration and circulation. After the cause of distension has been removed the breathing becomes easier and the circulation usually improves. In upper abdominal surgery, especially in extensive operations on the bile passages, observations have shown that a reduction of 30 to 40 per cent in the output of the lungs occurs; clearly demonstrating the serious embarrassment to breathing, which this surgical procedure produces. Further, deep anæsthesia is required, which renders the respiratory centre less sensitive. The traction exerted by the surgeon and his assistants still further complicates matters. The breathing is almost wholly abdominal. If using nitrous oxide it is usually necessary to supplement this with a certain amount of ether, unless one is willing to carry the nitrous oxide anæsthesia to the point of "secondary saturation". Ethylene gives greater relaxation than nitrous oxide but not so great as ether. With acetylene our experience has not yet been large, but it is spoken of very favourably by Weiland, Gauss and others. In using either ethylene or acetylene, one finds it

advisable to commence the induction with nitrous oxide on account of the disagreeable odour at present given off by these gases, though we are assured by chemists that when absolutely pure they have no unpleasant odour.

Drainage of the abdominal cavity or of an empyema may often be done under local anæsthesia. There are, however, cases in which a general anæsthetic is preferable, either from nervousness on the part of the patient or for other reasons. Nitrous oxide-oxygen or ethyl choride will generally be found best in these cases. The patient is usually very weak, especially in empyema; the dose of anæsthetic required is not large and either of these anæsthetics is rapidly eliminated causing little or no after distress to the patient. Nitrous oxide-oxygen has the advantage of being capable of administration under a slight positive pressure, which favours the distension of the lung, in recent cases after the fluid is evacuated, should this be considered advisable.

In *chronic pulmonary disease*, chronic bronchitis, emphysema, chronic phthisis and old pleural disease, anæsthetics are taken much better than in the more recent cases. The respiratory mechanism has, by constant use, become adapted to circumstances; instead of, as in recent cases, the adaptation being in process of establishment. Closed methods, speaking generally, should be avoided, and plenty of air or oxygen should be allowed. Nitrous oxide-oxygen alone, or with the addition of a little ether or of the C.E. mixture may be used. It is more important to keep the patient well oxygenated and prevent violent respiratory efforts than to avoid the use of some other anæsthetic in combination with nitrous oxide-oxygen. If the latter is not available, chloroform or the C.E. mixture in skilled hands, are perhaps better than ether, as they are less irritating to the air passages.

The circulatory system.—It is often erroneously supposed that the possessors of a vigorous vascular system are good subjects for anæsthesia and that the person with a weak circulation, with organic or functional circulatory derangement is unfit to take the anæsthetic. Almost the opposite is the case, the former usually having a powerful, vigorous physique, may be the cause of considerable anxiety to the anæsthetist by struggling, or muscular contraction causing an impediment to free respiration. The latter usually possess a comparatively feeble

muscular development and pass into anæsthesia with no excitement.

In valvular and other cardiac affections extreme care must be used not to embarrass the circulation by any restriction of air, therefore, if nitrous oxide-oxygen is used there must always be a sufficient supply of oxygen to maintain a well oxygenated condition of the blood. If necessary add ether rather than reduce the supply of oxygen below the need of the case. The C.E. mixture followed by ether, may be used on an open mask, but both are better given with oxygen through one of the vaporizing inhalers.

In patients, the subject of atheromatous arteries, care must be exercised to avoid any struggling, holding of breath, or any restriction of air during induction. Instances of cerebral hæmorrhage are on record during the induction with struggling and holding of breath even in chloroform anæsthesia. It has occurred during ether anæsthesia when there was very little struggling. A preliminary dose of morphine and atropine is often advisable in these cases as it assists us to secure a quiet induction.

In subjects of aneurysm the same avoidance of struggling, coughing, straining, etc., must be secured.

In venous thrombosis cases have been cited, both under ether and chloroform, in which the clot has been dislodged during the induction or later in the anæsthesia. It is quite probable that some of the sudden deaths recorded under anæsthetics and ascribed to their action, have been due to cardiac or pulmonary embolism.

Exhaustion, collapse, or shock may be met with in patients who are the subjects of long standing illness, or some severe, prostrating disease, *e.g.*, suppurating hip disease—especially in children—advanced stricture of the pylorus, strangulated hernia, intestinal obstruction, injuries caused by machinery, etc. In these, nitrous oxide-oxygen, or ether with oxygen to which 10 per cent carbon dioxide has been added is usually the anæsthetic to be preferred. In these patients during the anæsthesia the eyelids remain separated, the globes turned upwards so that the sclerotics only are visible; and profuse sweating—another indication of exhaustion—is common. The rosy cheeks of hectic subjects and of those artificially stimulated with drugs must not be allowed to deceive the anæsthetist, as these signs may coexist with a circulation totally unable to withstand a prolonged operation, though

a shorter operation may be fairly well borne. Often the pulse improves somewhat under ether, but later becomes weaker and is often apt to show greater weakness when the ether is withdrawn than during its administration. This early improvement of the circulation may be due to a slight stimulation of the nervous system by the ether or more likely to the lessening of the patient's anxiety as to his condition.

In *intracranial surgery* ether or nitrous-oxide may be used. The former is most conveniently given, by one of the various vaporizing inhalers, either mixed with air or oxygen. Chloroform is preferred by some. Mixed with oxygen there is less bleeding than with ether or nitrous-oxide—the brain being rendered more anæmic; probably due to the lower blood pressure of chloroform anæsthesia, and when given with oxygen to the better oxygenated condition of the blood, which can carry the required oxygen to the cells with less effort on the part of the heart. This is a matter of considerable convenience to the surgeon in operating; but the more pronounced breathing and fuller pulse of ether anæsthesia is a source of great comfort to the anæsthetist, being one of the chief indications left to him of the condition of the patient when the face is covered by towels. Owing to the lessened flow of blood through the brain when the intracranial pressure is increased, a higher percentage of anæsthetic in the blood is required to secure anæsthesia than when intracranial tension is normal. When the pressure is relieved by opening the dura a considerable increase at once takes place in the volume of blood flowing through the brain so that a dangerous, or even lethal dose of the anæsthetic, suddenly bathes the medullary centres. This must be anticipated by the anæsthetist and the dose of the anæsthetic lessened or even, if considered necessary, altogether withdrawn at the time of opening this membrane.

In brain surgery, once the site of operation has been draped with towels, etc., the face is hidden. The upper part of the body is left completely to the surgeon and his assistants, the anæsthetist usually sitting about opposite the patient's knees. He must be content with what information he can gather from the patient's respiration and circulation as determined by the radial pulse of the side on which he sits, and can note the peripheral circulation as shown in the skin of the hand or finger nails; if taking

the blood pressure also, he has a still better guide to the condition of the patient.

The method of anæsthesia may be similar to that used for a mouth operation, Doyen's gag with anæsthetic tubes is usually retained better than an anæsthetic tube without a gag. Some prefer nasal tubes and the intrapharyngeal method, others the intratracheal method. By any one of these methods ether may be administered mixed with either air or oxygen. Oxygen in these cases is to be preferred mixed with ether; for in the event of any interference with free respiration, caused by the position of the head, the decrease of the volume of air breathed is compensated by its richness in oxygen. Of course if the intratracheal method is adopted the airway is kept free by the intratracheal tube, this being the principal reason for use of the method in brain surgery.

Nitrous oxide-oxygen, or nitrous oxide-oxygen with ether, is sometimes preferred and may occasionally be strongly indicated. Here the necessity for closely fitting the face mask and the large diameter and less flexible tubing used with some nitrous oxide machines makes the administration more difficult. Care must be taken also to provide sufficient oxygen with the mixture at all times or venous engorgement may result and materially increase the difficulties of the surgeon.

In *depressed fracture, intracranial hæmorrhage, cerebral abscess or tumour*, the patient may be semiconscious, when very little anæsthetic is necessary; or if in a state of coma no anæsthetic is required.

During *menstruation* it is better to avoid an anæsthetic unless the operation is urgent. In some patients the nervous system is more unstable during this period; further, hysterical patients may ascribe a multitude of after-effects to the fact of an anæsthetic being given, or an operation performed at this time.

During pregnancy anæsthetics may be given. Care should be taken that there is no restriction of air which might cause muscular spasm, especially in the later months. During lactation anæsthetics may be given without interfering with the process.

In those afflicted with *insanity* the disease may be exaggerated temporarily, though this seems to be a rare occurrence.

In *epileptics*, seizures have been reported during anæsthesia. It must be of rare occurrence and one would imagine must be confined to the

induction period. In both these types particular care should be exercised to obtain a quiet induction if possible.

Occasionally in the past it has been necessary to use the actual cautery in the mouth and nose or parts adjacent to these orifices. With the advent of diathermy, now so frequently used in malignant growths of the face and its orifices, the occasions have multiplied greatly. Of the anæsthetics in use to-day—all are inflammable and with a certain percentage of air or oxygen more or less violently explosive—except nitrous-oxide and chloroform. In work on the upper part of the body we are therefore restricted to these two anæsthetics. Nitrous-oxide may be conveniently used when the site of the operation is sufficiently removed from the nose and mouth to allow the use of the ordinary face mask. Unfortunately most of our cases of diathermy are within the mouth. Gas may be given by the nasal inhaler or by a tube in the mouth as for tonsils and dental surgery. A large quantity of gas is required to maintain anæsthesia by this method owing to the need of using pressure above that of the atmosphere so that if the operation is of long duration, the question of expense arises and one must sometimes have recourse to the cheaper anæsthetic—chloroform. It is not always a question of expense, however, many surgeons preferring the latter drug, which is given by one of the vaporizing inhalers intended for this drug, "Stocks" or the ancient "Junker" or one of the later patterns of ether-suction machines, *e.g.*, the McKesson, care being taken to remember that the percentages shown on the scale are for ether and that, while high percentages of that anæsthetic are required, when using chloroform only about one-sixth of the quantity is needed to produce the same effect. The latter drug being of higher specific gravity does not vaporize so readily and will therefore be presented in a less percentage than the indicator shows so that the indicator on the McKesson machine will often be at the 3 per cent mark—as shown for ether—though frequently the 1 or 1½ per cent will give a sufficient strength.

A number of methods have been devised in an attempt to predict beforehand the probable risk to life incurred by a patient from the proposed operation. A few of these follow:

The breath holding test has been strongly advocated as an index of the patient's suitability

for operation. The normal individual can hold his breath for about forty-five seconds. Persons with a weak cardiac muscle can hold their breath only from ten to twenty seconds.

In taking the test the patient sits at ease, takes a deep inspiration and closes the mouth, the nostrils being compressed between the thumb and forefinger to avoid involuntary expiration. While the patient holds the breath as long as possible the time is taken. The breath holding capacity is lowered in a number of pathological conditions. The length of time in several has been estimated as follows:

In diabetes 16 to 35 seconds; in thyroid disturbances 10 to 35 seconds; in anæmia about 15 seconds; in mitral regurgitation, (compensated) about 40 seconds; in tuberculosis 12 to 15 seconds; in sepsis 12 seconds; in acute infective cellulitis about 15 seconds.

In dealing with diabetes, cardiac and renal cases, etc., this suspension test gives a fair index of the degree of risk and acts as a warning to the anæsthetist of the degree of resistance to operative procedure to be expected from the patient.

The pregnant woman can hold her breath twenty-five seconds. The pregnant woman who cannot hold her breath fifteen seconds is a poor obstetric or surgical risk and should be given anæsthesia only by a professional anæsthetist—nitrous oxide-oxygen being the anæsthetic of choice, the individual oxygen need being determined and supplied. In arriving at an estimation of the limits of safety for an operation under anæsthesia Froes and Declarifayt multiply the systolic pressure by 100, for the numerator of a fraction to be divided by the number of hundred thousand erythrocytes in the blood multiplied by the hæmoglobin percentage, *e.g.*, if we take a systolic pressure of 170, erythrocytes 3,600,000 and hæmoglobin 67 per cent we have

$$\frac{170 \times 100}{36 \times 67} = \frac{17000}{2417} = 7 \text{ plus which figure may be regarded as an indication of the safety limit.}$$

The so-called *energy index* is found by adding the systolic and diastolic pressures and multiplying the result by the pulse rate. The range of *normality* extends from 12000 to 18000.

Beaumont Connell's test for an undisclosed nephritis is an examination of response to exercise. In these cases the respiration and pulse rate both rise abruptly after the exercise, but although the latter comes back to normal almost at once, the respiration does so only after seven to eight minutes.

Case Reports

A CASE OF HYDROCEPHALUS
SIMULATING BRAIN
TUMOUR

BY ARTHUR W. YOUNG, M.D.

Montreal

The close association between hydrocephalus and brain tumour has often been recognized in the past. This case of hydrocephalus is of interest because of the close resemblance of the symptoms to those of brain tumour; at the time of the original examination, operation was considered but deferred because of the indefinite localizing signs.

The clinical classification of hydrocephalus varies to a slight degree, dependent on the author's mode of approach. It was quite common in the past to speak of an acute form which resulted from tuberculous meningitis, but the post mortem examinations did not uphold any great ventricular distension in this condition, so the term acute hydrocephalus has fallen out of use.

This leaves only the chronic form to be considered. It was usual to divide this form into an external and internal type dependent on whether the outside or the inside of the brain cavities respectively were involved. But as the external type occurs only as a sequel to cerebral atrophy or degeneration, as in the diplegias and general paresis, it is no longer considered as a true hydrocephalus. It is the internal form only which demands our attention in the consideration of brain tumours. Gowers in his text-book (edition, 1888) probably gives the best account of the subject up until 1914, when Dandy and Blackfan published the results of their investigation of the condition. Gowers stated that hydrocephalus might be congenital or acquired. The congenital form was ascribed to emotional causes such as maternal grief or to injury to the foetus by falls; it was noted to occur in families and it was supposed, without positive proof, that some relationship existed between uterine disease and hydrocephalus. The acquired form was regarded as: (1) secondary to a lesion that produced the effusion mechanically, such as tumours which caused obstruction of the veins of Galen, or to a meningitis

which blocked the foramen of Magendie, and the foramen of Luschka, or the foramen of Monroe; (2) of apparently primary origin as met with in Oppenheim's primary idiopathic hydrocephalus.

Dandy and Blackfan awakened new interest in the affection by the experimental observations which induced them to conclude that internal hydrocephalus is characterized by the progressive accumulation of cerebro-spinal fluid in the ventricles causing their dilatation and a consequent cortical atrophy and possible enlargement of the head. Further they were able to separate internal hydrocephalus into two forms: (1) obstructive—due to congenital malformation or to an inflammatory process or tumour at any part of the ventricular system, but usually at the aqueduct of Sylvius or the foramina of Luschka and Magendie. The hydrocephalus in these cases results because of a mechanical obstruction to passing of the fluid from the ventricles to the subarachnoid space where it is absorbed. (2) Communicating—caused by a barrier of adhesions at the base of the brain which prevents the cerebro-spinal fluid from circulating through the cerebral subarachnoid space where it is for the most part absorbed. Both types are essentially obstructive, one in the ventricular system, the other in the subarachnoid space.

In 1917 the same authors, and in 1921 Dandy, showed experimentally that the communicating

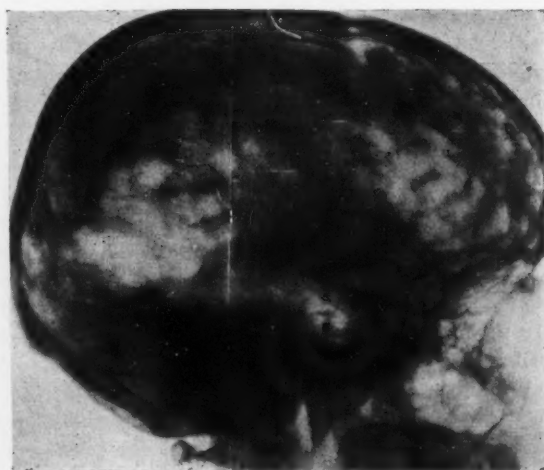


FIG. 1.—Ventriculogram demonstrating the hydrocephalus and the enlarged sella turcica.

type, *i.e.*, the idiopathic hydrocephalus of former authors, was caused as a rule by meningitic adhesions. The meningitis may occur ante- or post-natal, and it may be so mild as to be overlooked.

Not only do post-inflammatory adhesions in the region of the cisterna magna produce hydrocephalus of the communicating type but Dandy showed in 1925 also, that congenital mal-development of the subarachnoid space, tumours of the brain-stem and abscesses in the same region act in a like manner.

History of the case.—The patient, S.B., a Jewess, at the age of eight years received a severe fright which the mother regarded as the cause of the illness which was ushered in immediately afterwards. The patient from that time complained of severe headaches which increased in severity up to the time of her admission when twelve years old to the Royal Victoria Hospital, April 27, 1922, under Dr. Russel. On her admission, in addition to headache she suffered from vomiting, twitching of the face and sensations of pins-and-needles in the face. She was extremely nervous. There was no mental impairment, nor complaint of any disturbance with her eyesight, though an incipient optic neuritis was present. Babinski's sign was bilateral. The deep reflexes were normal. There was a coarse tremor of the out-stretched hands. The tone and power were normal. There was no inco-ordination. On spontaneous smiling, or on an effort to grip strongly, the mouth was drawn over to the right side. On percussion there was a distinct cracked-pot note associated with tenderness over the vertex of the skull.

The patient was transferred to the service of Dr. Archibald and a ventriculogram was made, using 120 cc. of air. This showed a large hydrocephalus, (see illustration). She rapidly recovered from the ventriculogram though for a short time she suffered from dizziness on sitting up. The calorific tests were active on both sides.

During the next two years she became almost totally blind; but of late the eyesight had gradually improved and on October 17, 1925, although there was advanced atrophy of the discs with very little vision in the left eye, the vision of the right eye was good.

For the first year after discharge from the hospital she suffered from epileptiform convulsions, but these ceased and she was free from them for three years until March 1926, when she had another. Up till then, for the three years, she had

been free from headache, dizziness and vomiting. In fact she appeared to be quite well.

The examination made on April 16, 1926, revealed a bright intelligent girl of sixteen years, of stoutish build; weight 162 pounds; height 5 feet 6 inches; circumference of head, 61.5 cm. The supraorbital arches were not prominent. There was no spacing of her teeth. The fingers were long and graceful. The percussion note of the skull was cracked-pot in character. The pupils were small and reacted very poorly to light and accommodation. Nystagmus of a fine character was present on deviation of the eyes in a lateral direction. The limbs were hypotonic. The upper limbs were unsteady when extended. Intention tremor was noted in the finger-to-nose test. The reflexes were all present and equal; no Babinski reflexes were present. There was no disturbance of gait and no Rombergism. The carbohydrate tolerance on May 31st gave a slightly decreased tolerance with a raised threshold. An x-ray of the skull on June 1, demonstrated as clearly as before the hydrocephalus, and an enlarged sella turcica.

Discussion.—The existence of an internal hydrocephalus is evident from the pneumograph and the x-ray of the skull, which demonstrates beyond all doubt an enlarged cranium and a distended ventricular system. In conjunction with this, is the enormous circumference of the head, 61.5 cm. as compared to the normal 51 cm.

The clinical history was highly suggestive of a brain tumour, the location of which was thought at the original examination to be central, pressing on one of the various small outlets through which the cerebro-spinal fluid passes. The triad of symptoms, headache, vomiting and optic neuritis favoured the diagnosis of brain tumour with secondary hydrocephalus.

The symptoms were first noticed eight years ago and to-day she is free from such complaints. It is admitted that brain tumours can subside, especially tuberculoma, and in a symposium on brain tumours in 1898 several of the writers made this observation, though Bramwell stated that it was exceedingly rare in the post-mortem room to meet with healed tumours or cases in which they had become encapsulated and quiescent.

On the other hand spontaneous recovery from hydrocephalus does occur and not infrequently. Dandy and Blackfan cited three cases in which recovery occurred. They remarked that a spontaneous cure in a case of hydrocephalus with an

obstruction congenital or otherwise at the aqueduct seems entirely impossible, but it is not impossible to assume recovery by a gradual disappearance of adhesions. Also, recovery might occur from an artificial puncture of the fourth ventricle, producing a new communication of the ventricles with the subarachnoid space. It seems most probable in this case that the hydrocephalus was the result of an obliteration of the foramen of Magendie and the recovery due either to artificial puncture of the fourth ventricle or to a disappearance of the adhesions.

In association with the hydrocephalus is the persistent cerebellar dysfunction which is expressed in nystagmus, hypotonia and intention tremor. In 1899 Bramwell reported two cases of hydrocephalus in which cerebellar signs were pronounced: in one a basilar meningitis with secondary hydrocephalus was found, and in the other the distension of the ventricles was due to an obstruction of the foramen of Magendie. In 1902 Spiller made a report of a case with dilatation of all the ventricles, due to the closure of the aqueduct of Sylvius by proliferation of the neuroglia in a patient with cerebellar signs. In 1905 Oppenheim recognized the close association of clinical signs of brain tumour with hydrocephalus in the report of two cases, one of which had bilateral optic atrophy, contracture of the sterno-mastoid and trapezius muscles, weakness of the left leg, right-sided Babinski and increased deep reflexes, and at autopsy an internal hydrocephalus was found. The other patient presented cerebellar signs and at the necropsy the only abnormality was an internal hydrocephalus. Another case with cerebellar signs was observed by Rhein in 1918, in which two cystic dilatations of the lateral recesses of the fourth ventricle situated at the cerebello-pontine angle were found at necropsy.

The association between hydrocephalus and pituitary disorders was brought to the attention of the profession by Cushing in 1912, though it was observed before by Marienescio and Goldstein in 1909. They reported two cases of hydrocephalus with adiposity of the female type and genital hypoplasia; one in association with a cyst of the cerebellum and the other of uncertain etiology. In 1910 Kurt Goldstein reported three cases of hydrocephalus in which sella turcica changes were noted, and obesity and undeveloped genitalia were obvious.

Cushing reported several cases in which posterior lobe insufficiency was present and one case

in which acromegalic features were striking. Other writers including Stumpf, Pollock, Strauch and Schultz have reported cases of hydrocephalus with pituitary disorder.

The pituitary dysfunction is this patient is confirmed by the general obesity, the thin moist skin, the typical 'en long' hand of Marie, the nervous temperament, the slightly decreased sugar tolerance and the enlarged sella turcica.

Summary

1. The clinical history in presented of a case of internal hydrocephalus in which the symptoms at the time of onset strongly suggested brain tumour. 2. In this case obliteration of the foramen of Magendie is the probable cause of the hydrocephalus and not brain tumour. 3. The absence of symptoms for three years, though cerebellar and pituitary signs are still evident, is the striking fact in connection with this case.

I wish to express my sincere thanks to Dr. Colin K. Russel and Dr. E. Archibald for their permission to publish this case.

REFERENCES

- (1) BRAMWELL, BYROM, *Brain*, 1899, xxii, 66. (2) BRAMWELL, BYROM, *Brit. Med. Jour.*, 1898, ii, 964. (3) CUSHING, The pituitary body and its disorders, 1912, 201. (4) DANDY, W. E. AND BLACKFAN, D. B., *Am. Jour. Dis. Child.*, 1914, viii, 406-482. (5) DANDY, W. E. AND BLACKFAN, D. B., *Am. Jour. Dis. Child.*, 1917, xiv, 424-443. (6) DANDY, W. E., *Bull. of Johns Hopkins Hosp.*, 1921, xxxii, 67-75. (7) DANDY, W. E., *Ann. Surg.*, 1925, lxxxii, 199-207. (8) GOLDSTEIN, KURT, *Arch. f. Psychiat. u. Nervenkrankh.*, 1910, xlvii, 126. (9) GOWERS, Diseases of the nervous system, 1888, ii, 542. (10) MARIENESCO AND GOLDSTEIN, M., *Nouv. icon. de la Salpetriere*, 1909, xxii, 628-649. (11) OPPENHEIM, *Monatschr. f. Psychiat. u. Neurol.*, 1905, xviii, 221. (12) POLLOCK, L. J., *Jour. Am. Med. Ass.*, 1915, liv, 395-398. (13) RHEIN, J. H. W., *Jour. Am. Med. Ass.*, 1918, li, 1933. (14) SCHULTZ, *Deutsch. med. Wchnschr.*, 1923, xlix, 1072. (15) SPILLER, W. G., *Am. Jour. Med. Sc.*, 1902, cxxiv, 44-55. (16) STRAUCH, A., *Jour. Am. Med. Ass.*, 1919, lxxii, 1731-34. (17) STUMPF, *Virchow's Arch. f. path. Anat.*, 1912, ccix, 399.

BANTI'S DISEASE IN A CHILD*

By H. P. WRIGHT, M.D.

Montreal

Herbert Gray, aged thirteen, was admitted to the Royal Victoria Hospital, February 16th, 1925, with the following complaints. (1) Vomiting blood; (2) blood in stools; (3) nervous and irritable.

History.—Born at full term, normal delivery;

*Read at the 4th Annual Meeting of the Canadian Society for the Study of Diseases of Children, Gananoque, Ont., June, 1926.

breast fed for six months and then weaned without difficulty; first tooth was cut at age of seven months; walked at age of one and a half years; underwent operation for tonsillectomy and adenoidectomy at two years of age. When four years of age he suffered from an attack of diphtheria. He also had measles, scarlet fever, whooping cough, mumps, and chicken pox during childhood. He was said to be subject to frequent colds.

Apparently the family considered his development normal until June 1921, when he became very irritable and nervous. His complexion assumed a yellowish hue and he vomited a considerable quantity of blood. The vomiting spell is said to have lasted about twelve hours; he also on this occasion passed blood in his stools.

The family physician diagnosed the condition as an injury to the stomach following a fall on a rock. He gradually regained his strength and returned to school in the autumn of that year. After about one month at school he again had a spell of vomiting blood but in smaller quantities than on the first occasion. Subsequent to this attack the irritability was again noticed, and his colour assumed a yellowish hue. On this occasion it was observed by the family physician that the heart, liver and spleen were enlarged, and he was referred to the Children's Hospital in Boston, where he remained for a period of six weeks.

Apparently, a diagnosis of splenic anaemia was made and splenectomy was discussed but not advised. On his return to his home in Vermont, his condition remained fairly good until May, 1924, when he again had a vomiting spell, this being the fourth attack. The fifth spell of vomiting occurred in October, 1924; from this he rallied quickly. In December of the same year however, he had his sixth attack of vomiting; this one was severe and lasted over a period of twenty-four hours. On February 16, 1925, he was admitted into the Royal Victoria Hospital. On admission the physical examination showed a rather thin pale boy, mentally alert and not acutely ill. The abdomen was round and full, the spleen was much enlarged, the lower edge being felt four finger-breadths below the costal margin in the mid clavicular line. The lower edge of the liver was easily palpable. There were no ascites and no haemorrhoids. Otherwise the physical examination was essentially negative. Morphologically the blood examination was as follows:—

Morphological Blood Examination by Dr. T. R. Waugh.—Red blood cells, 3,200,000; white blood cells, 3,900; haemoglobin, 48 per cent; colour index, 0.8.

Red blood cells.—Cells appear small and stain poorly. Moderate anisocytosis and poikilocytosis, slight polychromatophilia, no punctate basophilia or nucleated reds. No increase in reticulated reds. Fragility—moderately increased resistance. Corpuscle volume—19.3 per cent. Average corpuscle volume 60 cubic microns. Haemoglobin concentration I.

White blood cells,—of which 500 were examined.

	Polymorpho- nuclears	Eosino- philes	Mast	Mono- nuclears	Lymph- ocytes
percentage	71.6	4	0.4	10.2	13.8
number per c.c.m.	2792	156	16	398	538

There were no pathological cells. No toxic changes in polymorphonuclears.

Platelets.—Showed great variation in size; many very large. The bleeding time was normal. Coagulations: fibrin time, normal (5½ min); congealing time, slightly prolonged (12 min); retraction, started in two hours, later marked; no calcium deficiency.

Serum.—Pale chrome yellow with faint greenish tinge. Protein, 8.3%.

Conclusions.—A moderate hypochromic anaemia with evidence of lack of erythrocyte regeneration. The leucopenia is due to a decrease in polymorphs and lymphocytes. There is no evidence in the blood to explain the splenomegaly as an aleukemic lymphosis or myelosis, haemolytic jaundice or essential thrombopenia. The picture corresponds more or less to the findings reported in Banti's, but this is probably not an entity and therefore has no definite blood picture.

The intradermal tuberculin test was negative. Bacteriological examination of the intestinal flora reported *B. Welchii* in great numbers. The direct Van den Bergh test was negative and the indirect Van den Bergh test positive. The blood Wassermann was negative. A diagnosis of splenic anaemia was made, based on the haematemesis, splenomegaly, and the blood picture.

After one week's stay in the hospital the boy was discharged and returned home in order that the family might consider the advisability of splenectomy. On March 12, 1925, he was readmitted to the paediatric service and a few days later transferred to the surgical side in the service of Dr. Archibald. On March 15th, a direct blood transfusion of 250 cc. of blood was given. On March 16th, the spleen was removed by Dr. Archibald under gas-ether anaesthesia. The spleen was found to be without adhesions and the gastro-splenic omentum was more than usually developed. The spleen was of moderate size but without much evidence of peri-splenitis. Dr Archibald said that probably in all three or four ounces of blood were lost.

The patient stood the operation well, but on March 18th, complained of pain in the chest and on examination a to-and-fro murmur was heard over the heart. On March 23rd, signs of fluid at the base of the left lung were noted. On March 25th, 20 c.c. of a clear straw-coloured fluid were withdrawn. This fluid contained 360 cells per c.cm. largely made up of red blood cells and

lymphocytes. The fluid withdrawn contained 4.89 per cent of albumen. No bacteriological growth was obtainable from it, and after injection into a guinea pig in the usual manner no evidence of tuberculosis was found.

On March 27th, his general condition seemed poor, and a transfusion of 250 c.c. of citrated blood was given; his condition then materially improved and the left-sided pleural effusion gradually disappeared.

On April 4th, physical examination did not show anything abnormal in the heart or signs of fluid at the base of the left lung.

On April 9th, he complained of abdominal cramps and vomited several times. A diagnosis of intestinal obstruction was made and operation performed. It was found that a coil of the small bowel had become firmly attached to the under surface of the lower end of the previous incision over an area of about one and one half inches and the loop at this point had become twisted upon itself. The bowel below was found to be collapsed and above moderately dilated. The loop was carefully dissected off from the anterior wall taking with it a small portion of parietal peritoneum. No other adhesions were found.

On April 19th, signs of fluid were found at the base of the right lung and 5 c.c. were withdrawn. This fluid showed essentially the same characteristics as that which had been previously obtained from the left pleural cavity. The general condition of the boy continued to improve; the signs of fluid at the right base disappeared, and he was discharged on May 19th.

On November 6, 1925, he again reported at the hospital and said that he had had a good summer and felt fine and that there had been no more hæmorrhages. The physical examination on this occasion was negative except for a definite pallor and transparent appearance of his skin. The lower edge of the liver could easily be felt two finger-breadths below the costal margin in the mid-clavicular line.

The blood examination revealed.—Haemoglobin, 55 per cent; red blood cells, 3,220,000; white blood cells, 10,200.

On January 11, 1926, his uncle telephoned to Montreal and said that he was again vomiting blood, and that the family physician considered his condition to be very serious, as he had vomited six times in the last twenty-four hours. I was called to his home in Vermont and on arrival found him to be markedly exsanguinated. A transfusion of 150 c.c. from his father was per-

formed, but the boy failed to rally. The family physician informed me that following further gastro-intestinal hæmorrhages he died on January 18, 1926.

The pathological report of the spleen removed at operation stated that the spleen in size was 15 cms. by 10 cms. in width. The surface a reddish-brown on section. Cut surface reddish-brown. Pulp was soft (putty-like). Malpighian corpuscles showed up as white pin-head dots in the microscopic examination. Sections showed pulp to be diffusely infiltrated by a dense growth of fibrous tissue, and scattered throughout the pulp were red blood cells. The blood vessel walls were thickened and showed some hyaline changes.

Anatomical Summary.—Diffuse productive splenitis. It is to be noted that this is the histological picture found in Banti's disease but it is not found in this disease only.

Discussion.—This case it appears can be classified pretty definitely as one of Banti's disease. It is not proposed to discuss the differential diagnosis, and it must be remembered that there are those who do not consider Banti's disease as a distinct clinical entity, and may therefore prefer to consider the case one of splenic anaemia.

The most interesting feature of the case was, of course, the question whether operation was advisable or not. The spleen has been removed successfully by competent surgeons for a good many years, and there is no doubt that persons live for a number of years after this operation. Probably the best known case is that of Sir William Osler's upon which Dr. Harvey Cushing operated in 1898. In 1923 he was seen and reported that during the interval of twenty-five years he had enjoyed good health and been able to work fairly regularly, peddling and doing farm work.

Assuming then that in our case the operation was successfully performed, why did he only live such a short time? The answer must unquestionably be that the operation was not performed early enough.

It seems therefore that this is another case indicating that if operation is to be considered it should be done before involvement of the liver. From the case report it will be recalled that the liver was palpable before operation and from the perusal of the blood-findings it will be seen that the operation did not have any effect in the blood-picture. Another feature of some interest in this case is the pleural effusion which developed following both operations. Possibly it may have been a transudate following operation.

A CASE OF SYMPTOMLESS MIDDLE MENINGEAL HÆMORRHAGE

By C. M. EYNON, M.D., C.M. (Queen's),
F.R.C.S. (Edin).

St. Catharines

Traumatic hæmorrhage from the middle meningeal artery, if one may judge by the infrequency with which it is diagnosed, is sufficiently uncommon to justify the report of a silent case.

Ordinarily, as is well known, in 95 per cent of the cases it is the anterior branch of the artery which is ruptured leading to a fairly definite group of signs and symptoms the chief of which are: coma often preceded by a lucid interval, changes in the pupils from being small and reactive to large and non-reactive, commencing on the ipsilateral side, raised blood pressure, slow pulse and stertorous respiration.

It is with the idea of emphasizing that the train of events enumerated above applies only to the severe and rapidly progressive form and that smaller hæmorrhages which, while not dangerous to life, leave behind them a degree of permanent incapacity for work from headache, that this case is reported. It suggests very strongly that all skulls showing linear fractures traversing the line

of the middle meningeal artery should be explored with the trephine.

F.K., æt 38, Austrian, was injured on June, 18, 1926, by a railway tie falling on the right side of his head. There was no scalp abrasion but he was unconscious for ten minutes, and later took some aspirin. He reported to me on the 21st., still complaining of a buzzing right temporal headache. He had a 'black eye' on the right side and complained of stiffness of the muscles of mastication on the same side. The blood pressure was within normal limits and the pulse rate was ninety. The pupils were fairly small, equal, and reacted to both light and accommodation. I admitted him into hospital where an x-ray examination showed a linear fracture from the top to the base of the cranium near and parallel to the right fronto-parietal suture; it was slightly stellate and the inner table was very slightly depressed below the point of crossing the anterior branch of the middle meningeal artery.

On June 24th, I trephined and found an extradural clot some three-quarters of an inch thick and three inches in diameter. This was removed, and the artery was secured with ease in the usual manner above and by crushing the bone below. He made an uninterrupted recovery. At a suitable time I propose to repair the defect in the skull wall with silver plate.

Retrospects

RECENT ADVANCES IN HÆMATOLOGY

4.—THE VALUE OF SPLENECTOMY IN PURPURA HÆMORRHAGICA.*

By EDWARD S. MILLS, M.D., M.Sc.

Montreal

In a recent publication Whipple¹ reported eighty-one collected cases of purpura hæmorrhagica treated by splenectomy. This represents, by far, the largest series of cases yet published. A summary of the results clearly shows that removal of the spleen is the procedure of choice in chronic cases. This author, however, sounds a warning against

treating in the same way the acute fulminating type, of which there are fortunately few. Splenectomy, he found, had been performed on seventy-three cases of the chronic type with but six deaths, or a mortality of only 8.2 per cent. Of the eight acute cases in which this operation was attempted, seven died—a mortality of 87 per cent. The results in the sixty-eight surviving cases were classified as follows:—fifty-one good; four fair; and six poor. Fourteen cases were in good health one year after operation. Of the remainder, one was reported well 4.5 years, one five years, two six years, and yet another ten years, after removal of the spleen.

However, gratifying as these results may be, they far from prove that the spleen alone is the only site of the pathological agent, or is the agent itself. Kasnelson's² view that there is an excessive destruction of thrombocytes in the

* (1) The Origin of the Red Blood Cell in Adult Marrow, *Can. Med. Ass. Jour.*, Feb., 1926, xvi, 174. (2) Laboratory Aids in the Diagnosis of Anæmia, *Can. Med. Ass. Jour.*, April, 1926, xvi, 430. (3) The Blood Platelets, *Can. Med. Ass. Jour.*, July, 1926, xvi, 818.

spleen is being discredited, because it has not been confirmed by subsequent histological studies. Seeliger suggests a toxic injury and inhibition of the giant cells of the bone marrow as the etiological factor. Hamilton and Waugh³ are inclined to the view, that the whole picture is, like chlorosis, the result of some internal secretory dystrophy. Brill and Rosenthal⁴ believe, that in purpura hæmorrhagica the spleen is responsible for an alteration in the nature and agglutinative properties of the thrombocytes, and in addition, that it produces a toxin which destroys, or interferes with the normal function of the capillaries.

Whatever may be the true explanation of the clinical picture in this disease, it is quite evident that it is not merely a question of the number of thrombocytes. It is hard to explain the fact that, after the initial rise following splenectomy the thrombocytes occasionally return to their previous low level without the expected signs and symptoms. It may well be, that some unknown toxic agent changes the properties of the thrombocytes. In a recent investigation we found that, after the intravenous injection of a suspension of India ink in normal saline, the thrombocytes, which left the blood stream, were caught in the reticulum of the spleen. From

this they were rapidly taken up by the lienal phagocytes. If the dose of ink was sufficiently large, a thrombopenia, with spontaneous bleeding, rapidly supervened. In the cat, at least, the graveyard of altered platelets is the ellipsoids of the spleen.

It does not by any means follow, however, that the spleen itself is primarily responsible for the alteration in the nature of the thrombocytes which Brill and Rosenthal believe to exist in purpura hæmorrhagica. In view of the findings after splenectomy it seems more probable that in this disease the spleen merely shows its natural avidity for altered thrombocytes. By neither hypothesis, however, are all the blood findings explained, and it is eventually necessary to include the theory that there exists a pathological alteration of capillary tone. Further observation and clinical investigation are needed to settle these important points. In the meantime the splenectomized cases of purpura hæmorrhagica will be watched with interest.

REFERENCES

- (1) WHIPPLE, A. O., *Surg., Gyn. & Obst.*, 1926, xlii, 329-341. (2) KAZNELSON, P., *Zeitsch. f. Klin. Med.*, 1919, lxxxvii, 133-164. (3) HAMILTON, W. F. AND WAUGH, T. R., *Annals of Clin. Med.*, 1924, iii, 298-307. *Ibid.*, iv, 449-462. (4) BRILL, N. E. AND ROSENTHAL, N., *Am. Jour. Med. Sc.*, 1923, clxvi, 503-512.

Transfer of Infection by Handshakes.—This investigation made by Dr. H. W. Hill and Helen M. Mathews consisted of twenty-four experiments on handshaking in which the "give" hand was infected with various bacteria and the "take" hand was examined to discover any transfer which had occurred. These handshakes were varied as to the condition of the hands, "moist" or "dry", and the kind of shake, as "firm" or "dragged". In the early experiments pure cultures of *B. prodigiosus* were used in order to get the general run of results that might be expected. Later, cultures of pathogenic bacilli including *B. tuberculosis*, *B. diphtheriæ*, *B. typhosus*, were used and then the actual discharges themselves, i.e., tuberculous sputum, material from diphtheria throats, and typhoid faeces. Transfer was found to some extent in every case, except in the case of the typhoid faeces, and in one of the earlier experi-

ments where an antiseptic had been used on the hand and not fully removed. We have no explanation of the failure in this case. The faeces were used on the "give" hand but this once, and there was no opportunity to repeat the test later. The frequency of transfer was contrary to our expectations since we thought that transfer would occur only occasionally and that a very large number of handshakes would be necessary in order to secure a few in which transfer occurred. A noticeable finding was that the "firm" grasp, with both hands "dry", yielded as many, if not more, transfers than any other form of handshake. While it is true that the definite infection of the "give" hand in these experiments was undoubtedly quantitatively greater than it would be in actual practice, this would be offset in actual practice by the immensely greater number of handshakes that occur.—*Bulletin Harvey Club*, London, Ont. 1926.

Editorial

THE ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION IN VICTORIA

IT was peculiarly fitting that one of the best meetings in the history of the Association should have had for its stage setting the beautiful city of Victoria, the most westerly city of importance in the Dominion. No meeting has ever given so much evidence in its well defined transactions of the increasing scope and importance of the Association. The agenda of the Council which will appear in our next number, illustrates in no uncertain manner how rapidly the organization of the profession has advanced. Legislation is being systematically influenced; the best ideals of medical education and the most advanced measures for the protection of public health are being furthered; and at the same time the organization of the profession in each province and in the Dominion as a whole is attaining a completeness equal to the best in any country. The financial statement presented by the Treasurer was a pleasant revelation to the Council, illustrating in a material way the progress the Association is making. From an adverse balance as shown but a short time ago, the Treasurer revealed a budget for the coming year ample for developments and most satisfactory to all those interested in the progressive policy of the Association. The *Journal* received a well-earned meed of appreciation, when the Council officially placed on record its recognition of service well done by all those editors and contributors alike who have during the past few years laboured to maintain every issue at a high standard. We would call attention here also to the great value to the profession of the extra mural instruction which has been going on during the past year by means of the generous aid of the Sun Life Assurance Company; more recent advances in knowledge, and the most efficient meth-

ods in practice have been placed before the members of our profession in every province, and at the same time the activities of our public health departments have everywhere been stimulated. Unstinted praise is due to the Executive of the Association for this development. The success of the meeting itself, however, must in great measure be attributed to the untiring efforts of the members from British Columbia and from Victoria in particular. The beautiful city with its magnificent scenery, the excellent local arrangements and the ample accommodation provided, left nothing to be desired. An unusual spirit of co-operation featured the meeting, while the esteem in which the President and Committee were held, contributed in large measure to the enjoyment of the occasion.

The programme, practically an all Canadian presentation was in no wise inferior to that of any previous gathering. The Association may look forward confidently to the future with such an exhibition of progress behind it. C. F. MARTIN

It may be a dislocation of emphasis to begin a description of a medical gathering by talking about the place in which it was held, but Victoria is an all inspiring place. Nothing can occur in Victoria during the summer in which the occasion is not coloured by its wonderful setting. Bright days with glorious sunsets, and flowers, roses especially of all colours everywhere; and wonderful views of blue waters and green hills on every side; that is Victoria in July and here the meeting was held. Many members of the Canadian Medical Association will we are sure steal back in a quiet way to Victoria with the thought uppermost in their minds, "Better fifty years in Vic-

toria than a cycle in the East." Hospitality—let it be re-named Victoria.

Incidentally the meeting was a successful meeting from a scientific standpoint. The sessions were well attended, and although the absence of sections for the specialties may have meant some hardship for those engaged in them, the impression was general that the arrangement in Victoria brought the greatest good to the greatest number. We regret however, that in recent years at our gatherings opportunity is not given for carefully conducted discussions on the papers read. We believe that by means of discussion many important facts are brought out and emphasized, and members are enabled to carry away with them a better grasp of the subjects under consideration in the papers. There were several symposiums, one on Goitre, and one on Gastric Ulcer. It appears to require a great deal of moral courage for a programme committee nowadays to arrange a programme without a symposium. It has been likened to a circus without an elephant; and if the elephant does not

walk too deliberately and take up too much room, it undoubtedly has its uses. Notwithstanding this criticism, the papers presented by all the readers were of a high standard and in an unusual way covered a wide clinical field. The visitors from a distance who addressed the Association were, Dr. Moffitt of San Francisco, Drs. Lemon and Rowntree of Rochester, Dr. Barnhill of Indianapolis, and Dr. Ritchie Rodger of Hull, England. Dr. Goldschmidt gave an interesting account of conditions in South Africa, and Dr. J. O. Thompson of Canton spoke on conditions in China.

The Alumni dinners gathered into groups the graduates of the several Canadian universities. These are gatherings which it behooves the Association and the Universities to foster. The enthusiasm and good feeling resulting from them are an unlimited asset both to the schools and to the Association, and, perhaps, more than any other feature, may be regarded as a contribution from our Association towards the unification of Canadian interests.

A. H. GORDON

THE LONDON MEETING OF THE ONTARIO MEDICAL ASSOCIATION —THE SWING OF THE PENDULUM

THE annual meeting of the Ontario Medical Association took place in the city of London. Not only did the city and its citizens, but also the weather conspired to make the meeting an extremely pleasant one, one of the largest meetings the association has ever had. The papers were all of a high order and all the entertainments passed off with a considerable amount of éclat.

One important sentiment which was developed during the meeting was the desirability that the general practitioner should rely more on his own brain, eye and finger for his diagnosis, and less upon the aid to be obtained from the laboratory, valuable as all must regard the latter to be in certain cases. The patient must on no account lose confidence in the skill and judgment of his own chosen

medical adviser. Many of the papers read also emphasized this point, namely the importance of the physician arriving at a carefully thought out diagnosis by the methods of research within his own grasp. Dr. John B. Deaver of Philadelphia referred to the tendency of the age toward dependence upon laboratory measures, and made a strong plea for doctors to depend more than they do, on an intimate examination of the patient's body by well trained fingers and eyes. The keynote to the problem of the treatment of disease is undoubtedly a correct diagnosis. In considering a new patient the first thought of so many of our recent graduates from our best schools was, what laboratory tests were necessary, and the patient was rushed off apace for an x-ray examination or a complicated blood

test. These in Dr. Deaver's opinion were the last things to be considered. A careful attempt should be made to solve the problem by obtaining a history of the case which missed no significant point, by a careful examination of all parts of the body conducted with the keenest observation, and by an intelligent weighing of all the possibilities with the facts thus obtained clearly arranged in the physician's mind. We have let the pendulum swing from our former reliance on observations made by brain, hand and eye to an unfortunate fad for routine laboratory tests. The physician should recognize that the results and interpretations of our modern instrumental precision are fallible. The interpretation of x-ray findings even by the expert, involves many doubts and possibilities and fails to make a strong impression on one who has made many thousand excursions into the upper abdomen of the living subject. The surgeon of the present day must rely chiefly upon the

clinical history, physical findings, and his own past experience in establishing his own conclusions.

Dr. William Hutchinson of Ottawa, made a similar protest. "I have felt for some time," he says, "that we should get back to fundamentals as in my opinion the basis of all successful diagnosis must be a clear understanding of the principles of clinical medicine. Our older clinical methods can be used in the diagnosis of the majority of cases. Great importance should be placed on the history of the case. The chronological method is the only one which will give satisfactory results."

In concluding his address Dr. Rowntree of Rochester emphasized the same facts, and like Sir James Mackenzie placed the responsibility for advance in our knowledge with the men in every day practice as well as with Institutions whose object is technical research.

GEORGE A. RAMSAY

THE BRITISH PHARMACOPŒIA

THE Committee on Pharmacy of this Association was brought face to face this year with the question as to what position the Association should take in regard to the *British Pharmacopœia*. The last edition of the *Pharmacopœia* contained a great many Indian drugs and these inclusions together with the somewhat faulty character of its directions have led to its being very generally considered in Canada as a less suitable book than the United States Pharmacopœia. If the *British Pharmacopœia* is to be an Empire publication then Canada should have representation on the committee constructing the same. The feeling of the Committee on Pharmacy is that a Pharmacopœia for the Empire should be prepared under the auspices of a Conference representing the Empire at large. Each constituent Dominion as well as Great Britain and India should be represented by a member or members appointed by its representative medical associ-

ation and its representative pharmaceutical association.

This conference should have a Permanent Secretary, who might be advised by a Permanent Standing Committee the duty of which would be to prepare the material to be submitted to the initial meeting of the Conference, and secondly, to produce and sell the book. The Conference should decide all questions of scope and policy at a meeting held some two years in advance of the publication of the decennial revision. All technical questions should then be submitted to Special Committees. These Special Committees would not be necessarily representative in character. They might be entirely local, confined to Great Britain, or in time to some particular part of the Empire, though they might have corresponding members in other parts of the Empire. Some six months or more in advance of the publication of the

revision the Conference should again meet to hear and approve of the reports of all the Committees and finally determine the character of the book.

This solution would be satisfactory to Canada, and the Canadian Medical Asso-

ciation feels quite sure that unless some such policy is adopted in the future Canada will not agree to accept as its Pharmacopœia a book produced in the manner in which the present edition is compiled.

V. E. HENDERSON

NEW KNOWLEDGE OF MALARIA FROM ITS USE IN GENERAL PARESIS.*

THERE is nothing new in the observation that one disease may cause a favourable effect on another: perhaps, however, we do not so often consider what this therapeutic use of a disease may teach us in regard to itself. The treatment of general paralysis of the insane by means of deliberately induced attacks of malarial fever affords an instance in point. The improvement of the mental condition during intercurrent febrile attacks has been noted for long, and has led to the adoption of various procedures calculated to produce fever, culminating in Wagner-Jauregg's investigation into the effects of tertian malaria on general paralysis, a method of treatment in general paralysis, which is now receiving a good deal of attention.

Quite early in these investigations parasitologists saw that they were provided with a fresh point of view from which to study malaria, and the results of this study are now being reported. It had been shown by Wagner-Jauregg in his original paper in 1917, that the malaria which was intentionally induced in paralytics was usually quite easy to cure after the beneficial result was attained, and that relapses were very rare: this he believed to be due to the fact that the passage of the malaria parasites from one patient to another, instead of from mosquito to patient, as happens in nature, had in some way modified the virulence of the parasite and rendered it more susceptible to quinine. In order to examine the point further it was necessary to compare cases of malaria produced in

the natural way, *i.e.*, by the bite of a mosquito, with those arising from the injection of blood obtained from malarial patients, and this Professor Warrington Yorke has done. His inquiry followed two directions, first, to find out whether quinine given prophylactically prevented the development of malaria; and secondly, to examine the therapeutic action of quinine and determine whether mosquito-induced malaria was as easily cured by the drug as was the inoculated case, or whether there was just as much relapse amongst them as took place amongst those in tropical practice.

It soon became clear that quinine has no true prophylactic action in malaria. The administration of ten grains in solution daily for five days before, and for eight days after the bite of infective mosquitos failed to prevent the development of malaria, which appeared in the usual time. And if the dose were increased to thirty grains given on the day of infection and two succeeding days, there still was no warding off of the disease. Other experiments also have shown that quinine has no direct action on the plasmodia, since infection may still be induced with blood which has been mixed with a solution of quinine hydrochloride of a strength of 1:10000, or even, for a shorter time, of 1:5000. An important clinical deduction from this is that quinine given to a donor does not render the blood malarially harmless to the recipient.

As regards the second point, it appears that on the whole malaria, whether induced by injection, or transmitted by the mosquito in the ordinary way, shows

* Malaria Treatment of General Paralysis of the Insane, *The Lancet*, Feb. 27, 1926.

a remarkable susceptibility to cure with quinine, and, even, if relapse does occur, it shows little of the obstinacy of the ordinary case in practice.

Professor Yorke believes that the difference between the two types of case lies in the fact that the one is a primary infection, and the other is old-standing, and that it is the reaction of the patient which is the all-important factor, not the quantity or method of administration of drugs. This introduces a new theory for explaining the action of the quinine, which, as has been stated, is not a direct one on the parasites. Yorke and MacFie's view is that the quinine destroys, probably indirectly, large numbers of the parasites, and thus sets free a considerable quantity of soluble antigen. This latter provokes the formation of immune body by the host, and this, if in sufficient

quantity, destroys the remaining parasites. This theory may explain also why the over-administration of quinine is not only useless but may actually be deleterious, since it is possible that prolonged or excessive doses of the drug may exhaust the body cells whose reactions with it form the parasitocidal substances.

The conclusion, as expressed by Professor Warrington Yorke, is that "this interesting reaction of one disease upon another has thus a two-fold effect in that 'it blesseth him that gives and him that takes.' A not inconsiderable proportion of the paretics are restored to health, and those who suffer from malaria will doubtless in due course benefit from the advance of knowledge which the remarkable influence of this infection on the nervous disease alone has made possible."

H. E. MACDERMOT

JUVENILE COURTS

MODERN laws under which Juvenile Courts have been created are founded on old laws dating from the reign of Athelstan by which the king as *parens patriæ* was acknowledged guardian of all his subjects, particularly of the helpless. Chancery Courts from early times have been concerned with the property rights of infants, and in 1892 Lord Chancellor Collingham declared that this jurisdiction extended to the general rights and protection of infants.

In spite of beneficent legislation, however, excessive punishment of crime has persisted. In the 17th century John Dean, aged eight years, was hanged for arson, and in 1833 the death sentence was pronounced upon a child who had broken a pane of glass and stolen two pennyworth of paint. In New Jersey, in 1828 a boy of thirteen years was hanged for an offence committed the previous year.

The humanitarian spirit which threw off fear and prejudice, broke the shackles off the insane, removed the evils of filthy prisons, abolished scourging, and prohibited capital punishment for minor crimes, has found part of its expression

in the establishment of Juvenile Courts.

In 1898 Mr. Harvey B. Hurd, a member of the Chicago bar, drew up the first Juvenile Court Act, founded upon the old principle of the child as ward of the State. The delinquent child was to receive practically the care, custody and discipline that are accorded to the neglected and dependent child. Under this Act the first Juvenile Court was held in Chicago in 1899.

In Canada the Provincial Legislature of Ontario passed an act in 1888 authorizing the appointment of a special commissioner to try youthful offenders apart from adult offenders, but no action was taken. In 1908 however, the Juvenile Delinquents Act was passed by the Dominion Government, by which the Provinces were authorized to constitute and maintain Juvenile Courts. The first Juvenile Court in Canada was instituted in Winnipeg in 1908. Since then thirty-one districts in the various provinces have established Courts, some of the districts including more than forty municipalities.

The most important principles on which Juvenile Court practice is founded

are the following. The Court is established not on the principle of the punishment of the offender, but of an investigation of his case from the social, physical, and mental standpoints, regarding him as an abnormal or defective person rather than as a criminal, and using every possible effort towards his rehabilitation.

Parents, guardians, and other adults who have contributed directly or indirectly to a child's misdemeanor are liable to punishment.

Probation is indispensable. In all but the most serious cases the delinquent must be placed on probation, or under supervision in his own home, or in a special detention home. Where commitment is

necessary the offender must be sent to a specialized institution, industrial home, or school, but in no case should he be incarcerated with adults. When discharged he is still a ward of the Court.

By means of this organization of medical, social, and legal agencies, the juvenile delinquent has the best chance, under human limitations, of being saved from becoming a chronic law-breaker. But complete and harmonious co-operation of these agencies is indispensable, and is particularly desirable between the Juvenile Court and the Psychiatric Clinic. A. G. MORPHY.

Note.—The writer acknowledges his indebtedness to a pamphlet by Helen Gregory McGill, M.A., Judge of Juvenile Court, Vancouver, for the facts above noted.

THE ORIGIN OF ACRODYNIA

AN interesting pastime for any student of medicine is to trace out the lineal descent of a modern disease, to try if possible to find whence it arose. In such an endeavour one may find the disease so confused with kindred maladies that it is impossible to separate its identity. Sometimes one can find no description which tallies in any way with the disease until quite modern times. Conversely a disease like the "plague of Athens," so graphically described by Thucydides, seems to have no counterpart in our present day nosography. Everything must have a beginning and there seems no reason why a disease should not arise *de novo* even in modern times, so that no ancestry can be found for it in the history of medicine. Such a one would seem to be the so-called "Pink Disease" first described by Swift¹ of Australia and more generally known as acrodynia on this continent and as erythroedema in England. Prior to 1914 no evidence of this disease can be found in medical literature, ancient or modern—yet since that date numerous reports from all parts of the world testify to its ubiquity. The description of the disease in all these reports is so strikingly similar² that there can be no doubt as to its identity, and so one is forced to the con-

clusion that the disease has only recently appeared in our midst.

Despite the widespread interest that acrodynia has aroused in the past decade, its nature and origin still remain obscure. Though its course is tediously long and is little affected by treatment, comparatively few cases terminate fatally and there has been little opportunity for post mortem study. Paterson and Greenfield³ examined two cases post mortem and stated that they could find no evidence of microbial invasion of the nervous system, although there was a definite polyneuritis, which they considered was due to toxins derived from some focus of infection rather than to a disorder of metabolism such as beri-beri or pellagra. More recent studies by Warthin⁴ have shown that the changes in the skin and central nervous system present a similar pathological picture to the early stage of pellagra which would suggest either a food deficiency or toxic origin to the disease. It is to be hoped that further study will shed some light on the nature of this distressing disease which can turn an erstwhile healthy child into a veritable picture of misery.

REFERENCES

- (1) SWIFT, *Lancet*, 1, 611: 1918. (2) LINDSAY, *Canad. Med. Assoc. Jour.* Sept. 1922. (3) PATERSON AND GREENFIELD, *Quart. Jour. Med.*, Oct., 1923. (4) Warthin, *Arch. Path. and Lab.*, Jan., 1926.

THE EYE AND ITS INFLUENCE UPON EVOLUTION

PROFESSOR ELLIOTT SMITH in a recent Cavendish lecture delivered under the auspices of the West London Chirurgical Society took for his subject "The Eye and its influence upon Evolution." In opening his address he made the statement that the faculty of vision had played the most important part in making possible those achievements which distinguished man from other creatures. It was principally by vision that human beings apprehended the world around them. It was the visual control of the hands which made possible the art of learning, and it was through vision that the mind appreciated beauty in form, colour and perspective. It was also very largely by means of vision that human beings learned to understand one another. Vision played a significant part in human behaviour, and it was by watching movements, gestures, facial expressions, and even changes in the eye itself, that individuals learned almost unconsciously to appreciate the distinctive qualities of others, to interpret motives, and to communicate information.

The fundamental influence of vision in the development of man's intellectual superiority was evidenced in our language by such expressions as insight, foresight, and perception. Speech would even appear to be to some extent an outcome of our higher visual endowment, for when visual discrimination between objects became possible owing to evolution, the need arose for auditory symbolism to express to others conditions thus differentiated.

Among primitive animals smell was the dominating sense; the one by which the animal began to appreciate continuity of experience, a fundamental factor in existence. By this sense animals anticipated the taste of different foods, and in every animal group smell was depended upon, not only in the search for food, but in the recognition of sexual mates and rivals. But the sense of smell gave no indication of the position in space of the exciting object such as vision provided.

The predominating importance of vision as a stimulus to the development of the brain was evidenced by the fact that the brain of animals living in trees showed a lessened development in the size of the olfactory area, but a great increase in the visual territory of the brain. This was evident even in the lowest members of the order of primates. In the tarsiar, a tree dwelling lemuroid, vision for the first time in mammals replaced smell as the dominant sense. The same thing occurred in apes and monkeys, but the monkey greatly extended the range and precision of the conjugate movements of the eyes, whereas the tarsiar did not, but compensated for its lack by developing an astonishing range of head and neck movement.

In vertebrate animals other than mammals the eyes can move independently the one of the other, but in almost all mammals one eye cannot be moved without the other being moved also, and this power to make conjugate movements of wide range and increasing precision began with the monkey. In the monkey, also, with the gradual development of the cortex, the macula lutea made its appearance in the retina and the animal thus gained the power of discerning the details of objects, and of developing a nicer discrimination between colours and textures and shapes which to an animal without the macula was impossible. All this had a profound influence in stimulating the development of the cerebral cortex. The animal had its curiosity excited so that it handled and examined objects, cultivating in this way a power of skilled movement, and guiding its hands with developing dexterity. Under such stimulation also its auditory and its tactile capacity gradually increased. In the course of this evolution it became possible to apply these increased powers automatically, so that the animal was able to concentrate upon the things seen, rather than upon the motor act of seeing, and thus gradually acquired the ability to

concentrate for a particular purpose. The brain continued this progressive expansion until it reached its higher stage

in *homo sapiens*. Man's mental superiority was really based upon the seeing eye and dexterous hand.

THE LIMITATIONS OF COD LIVER OIL IN RICKETS

THE development of rickets has been emphasized by the profession as one of the dangerous possibilities of infancy, and child welfare agencies everywhere have preached the necessity for a liberal administration of cod liver oil to check any tendency to such development, and to cure it in cases in which it has developed. Evidence suggesting that the high expectations raised in regard to the efficacy of this treatment may not always be realized, has been reported by several writers. In a recent paper appearing in the *American Journal of Diseases of Children*, May 1926, Dr. May Wilson states that in a study of New York infants born in the spring and summer of 1924, and receiving graduated doses of from a half to one and one half teaspoonfuls of biologically tested cod liver oil, it was found that in infants of from one to three months old ninety-one per cent showed the existence of clinical rickets notwithstanding such administration. In a carefully observed study of forty-seven infants receiving daily doses of one, two and three teaspoonfuls of biologically tested cod liver oil, the development of clinical rickets was evident in sixty-eight per cent of the cases as compared with seventy-six per cent of the series of controls.

Ninety seven per cent of infants born in the summer, and ninety-one per cent of infants born in the winter even although given cod liver oil showed roentgenographic evidence of rickets; while in ninety-seven per cent of the infants born in the summer and ninety-eight per cent of the infants born in the winter and not receiving cod liver oil, rickets also developed. Thus a comparison

of the degree and incidence of rickets observed in infants receiving and not receiving cod liver oil did not reveal any striking difference. Moreover another significant feature of these New York infants was that the concentration of calcium and inorganic phosphorus in the serum of these infants showing early evidence of rickets, was within the normal range. Wilson asserts that the development of rickets in these babies in whom preventive cod liver oil therapy was instituted in the first month of life under special supervision is not easily explained. The findings described may be related to the rate of growth which in the fourth and fifth month is the most rapid in infancy. Rapid growth therefore may bear some relation to the above findings. It behoves us also to consider seriously the various food factors which may be lacking in the mother nursing her child and thus become defective in the infant's food. More attention must also be paid not only to dosage but to the assimilation of cod liver oil. Bloch of Copenhagen has sounded a warning in this respect. An English writer a few years ago called attention to the fact that in young pigs a well emulsified cod liver oil gave better results than the pure oil, when administered in equal amounts. The unqualified success obtained with the use of cod liver oil under carefully controlled conditions by John Howland of Baltimore should give encouragement and the assurance of the wisdom of its inclusion in infants' food as a matter of prophylaxis. The whole subject however demands careful study.

TUBERCULOSIS IN INFANCY

SIR ARTHUR NEWSHOLME in his recent addresses has stated that the mortality from tuberculosis was greatest in the first two or three years of life, and has emphasized the importance of protecting young infants from infection. This point has also been recently emphasized by Dr. Adami who spoke of the vaccine recently introduced by Professor Calmette as an important advance. We have already in previous issues referred to this vaccine now known as B. C. G. which is prepared from a virulent strain of bovine bacilli subcultured 230 times. After this prolonged preparation of subculturing Calmette stated that the vaccine was incapable of producing tubercles either by ingestion, or intravenous, intraperitoneal, or subcutaneous inoculation. Calmette states that it has been tested on an extensive scale in rabbits and guinea pigs, and that by its vaccination on infants under the age of fifteen days, a partial immunity has been obtained lasting at least six months. The number of calves immunized by this vaccine up to the end of 1925 was 3,051, and the authors state that the growth of these animals has been satisfactory and that no harmful results follow the vaccin-

ation. In 1921, Calmette proceeded to test the value of this vaccine on new born infants, and up till the end of 1925, 1,317 infants had been treated in this way. Thus far the figures show that of these 1,317 cases, 10 had died of tuberculosis by the end of the first six months. In criticizing the report the *Lancet* states that while all the infants vaccinated have been kept under observation, and when the environment proved unsatisfactory they have been boarded out, the statistics do not show the proportion of children thus removed from their homes. This prophylactic vaccination has also been employed as a test on 3,352 infants among the indigenous population of French colonies, but no reports have yet been received of its effectiveness. Calmette and his co-workers are certainly carrying out an important and extensive sociological experiment on bacteriological lines of which the ultimate results will be awaited with much interest. The *Lancet* in its editorial, however, considers that as yet the data are too vague and too lacking in controls, and the period of experiment is too short for anything like a final judgment to be passed upon the value of this vaccine.

THE SPLEEN IN MEASLES

IN the January number of the *American Journal of Diseases of Children*, Dr. Bleyer calls attention to the frequency with which enlargement of the spleen is found in measles. This enlargement is coincident with the eruptive stage of the disease and reaches its maximum on the third or fourth day of the rash, after which it rapidly diminishes to its natural size. *A priori*, one would almost expect to find an enlarged spleen in a general infection like measles, yet apparently the

frequency with which it is met has been overlooked, and as a result standard text-books frequently omit to mention the fact. One of the most recent works on paediatrics states that "the spleen is seldom enlarged or palpable." It is difficult to understand how such an obvious symptom as enlargement of the spleen could have been so generally overlooked, or is it perhaps a new reaction of the organism to the virus of measles?

A. M. LINDSAY

CRYSTALLINE INSULIN

THE insulin used in medicine is effective clinically, but it is far from being a pure product. Taking the ordinary insulin as used in medicine Dr. John J. Abel and his associates passed it through an elaborate series of precipitations with various chemicals and repeated solutions in weak acetic acid. In this way it has been reduced to a purity so great that it comes down out of solution in the form of minute crystals that shine like bits of uncut diamond when viewed through the microscope. The process is

slow and difficult so that months of work have resulted in the preparation of only a few hundred milligrams. Pure crystalline insulin however is extremely potent, one milligram of it about the size of a small grain of sand has as much power to reduce blood sugar as is possessed by 100 clinical units of the solution used in medical practice. One fiftieth of a milligram will throw a four and a half pound rabbit into convulsions which may be cured however by injecting a little sugar solution into the rabbit's veins.

ON ROBERT BURNS

SIR JAMES CRICHTON BROWNE* in a small brochure of a hundred pages just published, endeavours very successfully to prove that Burns, the poet, has been much maligned, and that while occasional lapses on the part of Burns in the way of overindulgence in liquor may have occurred at a time when such lapses were held to be more venial than now, the poet can by no means be classed as an habitual drunkard. One of the first biographers of Robert Burns was a Dr. Currie, who appears to have been a well meaning man, with a strong hereditary strain in him of the 'unco-guid,' and who, like a few other fierce teetotalers, smelt drink in almost everything, and everybody. Wilson, a later biographer wrote that not a man could be found in Dumfries, who had ever seen Burns intoxicated; and the life of toil he led, first as an agriculturist, and later as an excise man, approved by his superiors, would contradict any such supposition. Robert Burns had not a strong physique, and early in life suffered from rheumatism which brought on heart disease and

slowly but surely undermined his constitution. Sir James Crichton Browne in his volume gives chapter and verse throughout his book in support of this belief, and criticises severely the treatment given to the patient by his last medical attendant Dr. Maxwell who sent him, a sufferer from valvular disease of the heart, to the Brow-Well Spa where he was lodged in a thatched cottage with 'only a but and a ben,' and nothing in the way of food but porridge and milk. Still further the unfortunate patient was recommended to indulge in sea bathing and horse exercise. Naturally, he got steadily worse while he was there, and after a sharp feverish attack he had to return home, where he died three days later. Burns undoubtedly suffered, like many highly-strung individuals, from an inherited predisposition to nervous depression aggravated by the pressure of wearing and incessant toil, rheumatic pains and a diseased heart; all of which fully accounts for the many self accusations scattered through his letters and poems. Dr. Crichton Browne has written a good book and a charitable one. Every Scot who appreciates Burns' poetry should have a copy.

* Burns from a New Point of View. By Sir James Crichton-Browne. London: Hodder and Stoughton, Ltd., 1926. (Cr. 8vo, pp. 92. 3s. 6d. net.)

VERDICT IN POLLUTED WATER CASE

MISS SUSIE McQUEEN, a young woman employed in the Registrar's office, Owen Sound, has contributed an important chapter to the public health history of Canada, in that she has been successful in gaining a verdict against a municipal corporation for its neglect to protect the public water supply.

Owen Sound is a city of some 15,000 people, located on the Georgian Bay about 115 miles northwest of Toronto. The city has a picturesque situation. The business and part of the residential area of the city lies on the banks of the Sydenham River. The remainder occupies the rocky horseshoe escarpment surrounding the lower level.

There are two sources of water supply. The one supplying the higher level comes from the Sydenham River, and is filtered; the low pressure system comes from springs which arise in the rocky area in the neighbourhood of Inglis' Falls. The two systems are interconnected and the lower level supply is supplemented in times of shortage and under certain circumstances by the river water. The spring water, being much cooler, is the more popular.

The city had an outbreak of typhoid fever in 1916, with a few deaths, and the Provincial Board of Health has since that time persistently urged that the spring supply, to which a filter (much overworked) had been added, should be chlorinated. The local laboratory, which was established in Owen Sound by the Provincial Board kept a daily check on the waters, and the city had ample warning of the dangerous nature of the supply.

All went well, however, until the autumn of 1925, when an outbreak of twenty-five or thirty cases occurred. Most of the cases were limited to an area supplied by the combined systems. There was some evidence that the low pressure reservoir might be providing the infection and this was cut off after the outbreak occurred.

At the trial on June 17th, last, a great array of witnesses was examined on both sides. In the absence of any other cause and the proved character of the water supply, the weight of evidence pointed to polluted water as the cause.

In his finding, Mr. Justice Logie, before whom

the case was tried, rebuked the civic authorities, the corporation, the utilities commission and the local board of health concerned in the supplying of water to the city, for negligence.* He found that all three bodies were equally negligent. He stressed the fact that chlorination of Owen Sound's water supply had been left off, despite repeated warnings, until it was too late and the whole community was caught in an epidemic of typhoid fever. The plaintiff was given judgment for \$2000 and costs. The case will probably be appealed. If finally successful the city may be faced with a similar action on behalf of a score or more victims.

There are few court decisions in Canada in regard to the responsibility of corporations for the protection of the public against sewage polluted water. A few years ago the Dominion Canners lost an action of the kind, and suffered damages to the extent of \$14,000. The Owen Sound case is the first successful action of this nature against a municipal corporation.

No matter what may be the final result, the verdict in the Owen Sound case marks a new era in relation to the question of municipal protection of water supplies. Too often the local authorities when urged to afford protection to their water supplies, advance the well-worn argument "We have never had any typhoid". Invariably, if the use of untreated water is continued, communities sooner or later are caught, when it is too late. If the judgment referred to holds on an appeal, municipalities will feel constrained to take precautions in respect to their water supplies in advance of epidemics of typhoid. In any event, the result of Miss McQueen's action forms a salutary warning to other municipalities selling polluted water to their people, and is an example of courage that is commendable.

* Typhoid in Ontario should be extinct, as extinct in these present-day conditions of public health and public instruction in health as the dodo. The credit for the fact that there is very little of it in Ontario must be laid to the able and strict administration of the Department of Health in Toronto under Col. McCullough. In this case, even, there is evidence of an untiring effort on the part of the Department to bring about a safe condition of the water in Owen Sound over a period of ten years.

Editorial Comments

OSLER BRONZE MEDAL AT UNIVERSITY OF OXFORD

We note that a bronze medal has been designed for the committee of the Osler Memorial Fund, and it has been accepted by the University of Oxford. This bronze medal is to be awarded once every five years to the Oxford medical graduate who shall in the opinion of the board of awarders have made the most valuable contribution to the science, art or literature of medicine and who has not previously received the medal. Any residue from the income of the fund after payment of all expenses in connection with the medal may be used at the discretion of the members of the board of awarders in making grants from time to time to teachers in the Oxford medical school to enable them to pursue some special study connected with medicine outside the University.

FLUORINE POISONING

The toxic effects of long continued but small doses of iodine and bromine and their derivatives are recognized. Recently a chronic poisoning by another member of the halogen series has been described by Professor Cristiani. Fluorine is apparently present in minute quantities in many of our foodstuffs and was at one time employed as a preservative, but its use as such is now prohibited in most countries.

In some districts in Switzerland an endemic disease has occurred among animals characterized by wasting and cachexia with a special localization in the vertebral column and lower limbs. The bones become softened and frequently show spontaneous fractures. On account of this last symptom veterinarians have regarded it as a form of osteomalacia. Professor Cristiani has attempted to disprove this, and considers that the symptoms shown by these animals are not a true osteomalacia but a cachexia due to fluorine which may be present in toxic amounts in water into which industrial products have been allowed to pass. Experiments made by him consisted in feeding animals on diets in which hay mildly impregnated with certain salts of fluorine or grass submitted to the action of fluorine, in one of its forms, was fed. The experimental animals wasted and eventually died with symptoms of

bulbar paralysis. At autopsy the bone marrow was found to be extremely scanty and the bones showed a high fluorine content. The professor is at present studying the question as to whether chronic fluorine poisoning occurs in man.

BIRD DROPPINGS AS AN INFECTIVE AGENT

In his annual report the Medical Officer of Health for the City of London draws attention to the nuisance caused by the increasing number of pigeons in the city, especially in market places where their excreta contaminate the stalls about which they congregate. Although there has been no actual evidence of danger to health there are definite possibilities of an injurious contamination of foods, and the health officer proposes to request legal powers to reduce their numbers as may be deemed desirable. The same possibility holds true regarding the contamination of water supplies. The excreta of pigeons and gulls and many other birds contain both colon bacilli and streptococci in large numbers, and of types which cannot be differentiated from similar organisms derived from human sources. The droppings of gulls frequenting the West Middlesex Water works were found to contain at least one million typical colon bacilli per gramme. Fortunately there is little evidence of the presence of pathogenic bacilli in the excreta of birds. One organism however, *B. psittacosis*, in April, 1892, gave rise to an extensive outbreak of disease in Paris with forty-two known cases involving fourteen deaths. This strain which caused the outbreak was identified with the *B. aertrycke* which is frequently associated with outbreaks of human food poisoning. This would appear to be the only outbreak in which it was suggested that bird droppings might have been the cause. At present they must be regarded as a nuisance only which, as far as possible, should be prevented.

CERTIFICATES OF HEALTH BEFORE MARRIAGE

In the May number of the *World's Health*, Dr. Leopold Bard of Buenos Aires, discusses the bill dealing with the question of demanding a health certificate from every man before marriage, which is now before the Argentine Chamber of

Deputies. In his opinion venereal disease should constitute a temporary bar to marriage. The consequences of marriage when the husband is suffering from venereal disease are disastrous; illness, disablement, still-birth, poverty, and prolonged unhappiness. Just as the law provides a penalty for infanticide so thinks Dr. Bard should it punish the spread of venereal disease through marriage. The proposed bill provides that any man desiring to marry must during the fortnight preceding the registration of his intended marriage undergo a medical examination and provide himself with a certificate stating that he is free from any form of venereal disease. Provision for such medical examination is made by the establishment at the National Public Health office of a special bureau for the delivery of pre-matrimonial certificates. No marriage will be registered without a previous examination of the male party and the production of a certificate stating that he is free from venereal disease.

OIL OF WINTERGREEN

The *Journal of the American Medical Association* in a recent number calls attention to the poisonous symptoms which have occasionally arisen from the improper use of methyl salicylate, more familiarly known as oil of wintergreen, and frequently used for external application in rheumatic affections. It is readily absorbed and produces the effects of salicylic acid. Salicylates and closely related compounds have a widespread use as analgesics and antipyretics and this methyl salicylate is the active principle in several patent preparations sold to the public. Drs. Wetzel and Nourse in an article in the *Arch. of Path. and Lab. Medicine*, (1-182, 1926), state that poisonous symptoms may be produced by relatively small amounts, owing to its great lipoidal solubility, and the readiness with which it is absorbed. Absorption of less than 15 c.c. has on several occasions, resulted in death.

MATERNAL MORTALITY*

The Maternal Mortality Enquiry requested by a resolution of the Conference on Medical Services in Canada held in Ottawa on December 20th, 1924, has been carried on under the direction of the Minister of Health in the manner already briefly described in the *Canadian Medical Association Journal*, Sept. 1925, page 941.

* Prepared for the Annual Meeting of The Canadian Medical Association, Victoria, June 23, 1926.

The Registrar-General of Births, Marriages and Deaths in each Province, and the medical profession throughout Canada have given valuable assistance in preparing and forwarding the necessary returns for the year July 1st, 1925 to June 30th, 1926, and in advising the Department of Health as to the causes of death in childbirth, and the means of preventing such deaths. The Dominion Bureau of Statistics has also rendered indispensable assistance. It was estimated that about ten thousand returns as to the Death Certificates of women from fourteen to fifty years of age would be received from the Provincial Authorities and that a certain proportion of these would form the basis of the enquiry. This estimate appears to be fairly correct, and it would now seem probable that all the returns will be in hand on or about September 1st.

The instances in which no answer has been received to the enquiry issued by the Department of Health to the physician (or other person), whose signature is attached to the Certificate of Registration of Death have been few, and the Deputy Minister wishes to express the thanks of the Department for the invaluable co-operation and assistance received from the profession, the Provincial Registrars and the Dominion Bureau of Statistics in this enquiry. It is hoped that the Report may be ready for publication early in 1927.

HELEN MACMURCHY

JUVENILES AND YOUNG PERSONS IN PENITENTIARIES

Do not forget them. Two of them, convicted (no doubt justly) before they were twenty-one years of age will not finish their penitentiary sentences until 1930 and 1933 respectively. Did they ever have a chance? Did they have anything like a happy childhood? On or about March 31st, 1926, the Minister of Justice said from his place in the House:

"There is another thing to which I am giving a good deal of thought and that is the possibility of segregating the young convicts who are sentenced for the first time. Under present conditions they are mixed up with the hardened criminals and that does not give them a chance. If we could find a way to build a special institution, or even two institutions for the purpose of receiving and keeping these young men, rather than put them with the hardened criminals, I think that would be a good reform to undertake."

People who are bodily sick are often cured by

suitable treatment. Treatment to cure the offender of his evil ways is not a dream. The principles are known. The centenary of John Howard, the great prison reformer falls in September, 1926. The new House of Commons when they take their seats should not forget the boys in the penitentiaries of Canada.

H. MACMURCHY

ACTIVITIES OF ROCKEFELLER FOUNDATION IN 1925

Through its departmental agencies (the International Health Board, the China Medical Board, the Division of Medical Education, and the Division of Studies), the Rockefeller Foundation spent \$9,113,730 during 1925. George E. Vincent, Ph.D., the president, states in his annual review that the foundation engaged in the following activities:

- (1) Aided the governments of eighteen countries to combat hookworm disease; (2) gave funds to the budgets of organized rural health services in 220 counties in twenty-six American states and in eighteen districts in Brazil, Poland, Czechoslovakia, Austria and France; (3) took precautionary measures against yellow fever in Salvador, Guatemala, Nicaragua and Honduras; (4) continued to work with Brazil in freeing its northern coast from this disease; (5) sent a yellow fever commission to the West Coast of Africa; (6) helped to show the possibilities of malaria control in twelve American states, and in Brazil, Argentina and Italy; (7) shared in the development of professional training of public health officers at Harvard University and the University of Toronto and in schools and institutes in London, Copenhagen, Prague, Warsaw, Belgrade, Zagreb, Budapest, Trinidad and Sao Paulo; (8) contributed to the progress of medical education at Cambridge, Edinburgh, Copenhagen, Brussels, Utrecht, Strasbourg, Beirut, Singapore, Bangkok, Sao Paulo and Montreal; (9) provided emergency aid in the form of literature and laboratory supplies for 112 medical centres in Europe; (10) maintained a modern medical school and teaching hospital in Peking with 164 students and fifty-five teachers; (11) aided two other medical schools and nineteen hospitals in China; (12) helped to improve the teaching of physics, chemistry and biology in three Chinese and seven foreign institutions in China and in the government university of Siam; (13) supported nurse training courses in Peking Union Medical College, Yale University, Vanderbilt University and the George Peabody College for Teachers, and contributed to nursing education and service in Brazil, France, Yugoslavia and Poland; (14) provided current funds for an Institute of Biological Research in the Johns Hopkins University; (15) assisted departments at Yale and Iowa State universities engaged to biologic and mental research, and aided the Marine Biological Station at Pacific Grove, Calif.; (16) provided, directly or indirectly, fellowships for 842 men and women from forty-four different countries, and financed the travel of fifty other persons either in commissions or as visiting officials and professors; (17) contributed to the League of Nations international study tours or interchanges for 128 health officers from fifty-eight countries; (18) continued to aid the league's information service on communicable diseases; (19) made surveys of health

conditions, medical education, nursing, biology and anthropology in thirty-five countries; (20) lent staff members as advisers and made minor gifts to many governments and institutions; (21) assisted mental hygiene projects both in the United States and Canada, demonstrations in dispensary development in New York City, and other undertakings in public health, medical education and allied fields.

RESEARCH ON SLEEP

The Mellon Institute of Industrial Research, University of Pittsburgh, announces that a broad study of problems connected with the promotion and maintenance of healthful sleep will be undertaken by Dr. H. M. Johnson and Mr. G. E. Weigand, psychologist, and Dr. T. H. Swan, physical chemist. This investigational work is being supported primarily for the benefit of the public and consequently the experimental results will be published.

TOXÆMIA OF BURNS

An interesting discussion on the toxæmia and death which may follow burns is well summarized by Dr. G. T. Pack (*Arch. Path. & Lab. Med.* 1926, i, 767.) He considers that the poisonous substance producing the toxæmia comes from the burnt tissue and is carried into the blood. If the tissue is excised toxæmia is prevented. If the burnt skin is transplanted from one animal to another the latter has the symptoms and dies. If one of a pair of experimental Siamese twins is burned both have the symptoms, and experiments with cross circulation show that the animal which is poisoned is the one in which the blood from the burnt tissue circulates and not the one in which the burnt tissue forms a part. The poison is not generated in the process of burning but subsequently. Symptoms in man do not appear till at least twenty-four hours after the actual burning. The facts are strikingly in accord with those of secondary shock due to the absorption of histamine and similar bodies produced in the disintegration of slashed up tissues. This also gives a satisfactory explanation of why the danger of a burn depends more on its surface than on its severity. The poisonous products do not come from tissues which are thoroughly destroyed but from the tissues in the next zone where the cells are killed by the heat but not actually burned. These dead cells autolyze and break up. The dangerous tissues are the tissues which have been heated just enough to kill them without destroying the autolytic ferments or causing much chemical decomposition.

Correspondence

Our Edinburgh Letter*(From our correspondent)*

AN HISTORIC CELEBRATION

Last week was celebrated in Edinburgh the bicentenary of the Medical Faculty of the University. There are many reasons why this anniversary should not be allowed to pass unnoticed. In 1505, thirteen years after Columbus first visited America, and eight years before the battle of Flodden, the incorporation of the Barber Surgeons received its first charter from the Town Council and was constituted one of the Crafts of the Burgh. Since those distant days that body, now represented by the Royal College of Surgeons of Edinburgh has carefully tended the torch of medical learning. At first a system of apprenticeship preceded the curriculum as we now know it. The ceaseless brawls and bickerings that served Scotland for a history in those days were however, not conducive to quiet study, or the pursuit of science, and many went abroad to seek their training and degrees in the continental schools of medicine.

A warrant for the erection of a College of Physicians was granted in 1621 by that "familiar autoerat" King James VI. The Civil War, and the customary cracking of crowns which intervened, caused a delay, and the charter was not finally obtained until 1681. Four years later Sir Robert Sibbald, James Halket, and Archibald Pitcairne were elected by the Town Council, Professors of Physic in the University. These positions were honorary and the duties must have been somewhat perfunctorily performed as Pitcairne occupied the Chair of Physic in Leyden and Edinburgh at the same time, while Sibbald allowed several years to elapse after his election, before advertising a course of lectures. In 1694 the privileges of the incorporated Surgeons were extended under a new patent. The boundary of city walls was removed and they were permitted to admit to their incorporation any, who wished to practise surgery and pharmacy in the south east of Scotland, and in the "Kingdom" of Fife. Anatomical material became officially available for the first time, the Town Council furnishing the subjects, and decreeing that every year there was to be a public anatomical dissection. The first professor of anatomy was Robert Eliot who received the sum of fifteen pounds per annum as salary. In 1720 Alexander Monro, "The First Monro," who has been called the "Father of the Edinburgh Medical School" became professor of anatomy at the age of twenty-three.

A few years after his appointment the fury of the mob, who believed that the graves of Grey Friars Churchyard had been spoiled by medical students, drove Monro from the Surgeons Hall to seek shelter within the walls of the University. Thus was the thin edge of the medical wedge inserted in the walls of our Alma Mater.

Four Fellows of the Royal College of Physicians, Rutherford, St. Clair, Plummer, and Innes, who for some years had been teaching along with Monro in the Surgeon's Lecture Hall, now applied to the Town Council to be translated within the walls of the University. In February 1726 the Council unanimously granted their petition and appointed Andrew St. Clair and John Rutherford professors of the theory and practice of medicine, and Andrew Plummer and John Innes, professors of chemistry and medicine. At the same time Joseph Gibson, a member of the College of Surgeons was elevated to the newly created Chair of Midwifery. These with Monro, the Professor of Anatomy formed the original faculty, in which there were five chairs, as Rutherford and Innes taught conjointly the practice of physics.

It will be noticed how frequently the Town Council appears in history as patron of the medical arts. To this enlightened body, acting in concert with the Royal College of Physicians and Surgeons, must be given the credit of the founding of the medical faculty. Nor did the activities of those three bodies cease with the establishment of the teaching chairs. The practical application of their ideas called for the establishment of a large general hospital. George Drummond, the Lord Provost of the city, along with Monro primus, a Fellow of both Colleges, supplied a lead to the effort of collecting the funds required. In 1741, the Royal Infirmary was opened on the site it was to occupy for 138 years, until the removal to its present home upon the Meadows.

Since 1726 the history of the Medical Faculty has been one of steady growth. The original five chairs have increased to twenty-one. The old 'straightened' class rooms in the Kirk o'Field are long forgotten and have disappeared. At the tercentenary celebrations of the University the new medical buildings which adjoin the Royal Infirmary were opened. The present bicentenary celebrations coincide with the opening of a new surgical laboratory to meet the most pressing requirements of modern teaching.*

* The Edinburgh Medical School, A. Logan Turner, M.D., Scotsman.

The celebrations of the bicentenary commenced on Thursday, June 10th, when a dinner was held in the Upper Library of the old College. The Principal, Sir Alfred Ewing presided. Among others present were Sir A. E. Garrow, Oxford, Sir Humphry Rolleston, Cambridge, Sir John Rose Bradford, Royal College of Physicians, London; Sir George Newman, Ministry of Health. The overseas representatives included Prof. W. Stewart Lindsay, representing Dalhousie and Saskatchewan Universities. Prof. Whitnall, from McGill, Prof. William Boyd, Manitoba; Prof. Alexander Primrose, and Dr. F. L. M. Grasett, Toronto, and Prof. R. Tait Mackenzie from Pennsylvania.

The principal in proposing the toast of the guests stated that though the university was technically the host, it had associated with it the two historic bodies, the Royal College of Physicians of Edinburgh and the Royal College of Surgeons of Edinburgh.† In referring to the honorary graduates, he said they had exercised a restriction for which he ought perhaps to tender their foreign visitors some apology. On this occasion they had decided to give the honorary degrees only to sons of Edinburgh. He referred to the great teaching schools of Padua, Leyden and Paris, from whence flowed the stream of medical culture that played such an important part in the foundation of the Edinburgh Medical Faculty.

Professor Van Der Hoeve of Leyden, in replying mentioned that 1,400 Scotsmen had studied at Leyden. Dr. Robert Vaudesal of the University of Paris, Sir H. D. Rolleston, and Dr. Andrew Balfour, Director of the London School of Tropical Medicine also replied. Professor Sir Archibald Garrod, of Oxford, proposed the toast of the Edinburgh School of Medicine. Edinburgh had been the first really organized medical school in this island. The Medical School of Oxford University had been largely composed of the men whom they had stolen or borrowed, taken or acquired from Edinburgh. The toast was replied to by Professor Lorraine Smith, Dean of the Faculty of Medicine, Professor Robertson, President of the Royal College of Physicians, and Dr. Logan Turner, President of the Royal College of Surgeons.

On Friday, June 11th, honorary degrees were conferred on ten eminent medical graduates at a graduation ceremony held in the McEwan Hall. Andrew Balfour, Director of the London School of Hygiene and Tropical Medicine; Robert Howden, Professor of Anatomy, University of Durham; W. T. A. Jolly, Professor of Physiology, University of Cape Town; Sir George Newman, Ministry of Health; Alexander

Primrose, C.B., Professor of Clinical Surgery and Dean of the Faculty of Medicine, University of Toronto; Sir John Robertson, Professor of Public Health, University of Birmingham; Ralph Stockman, Professor of Materia Medica and Therapeutics, University of Glasgow; Arthur Logan Turner, President of the Royal College of Surgeons, of Edinburgh; James Wilson, Professor of Anatomy, University of Cambridge.

The Dean of the Faculty of Law, Professor James MacIntosh said in introducing Professor Primrose: "In Professor Primrose we are fortunate in having an ideal representative of Canadian Medicine with a slight flavouring of Scottish for he is a native of Nova Scotia, was trained here in Antiqua Scotia, and has been associated for most of his professional life with the University of Toronto. He began practice as a surgeon, and soon after was appointed to the Chair of Anatomy in which he built up a flourishing department on the Edinburgh model. He resigned his chair after eleven years tenure in order to give undivided attention to his practice; but he was soon recalled to the university precincts—this time as Professor of Clinical Surgery. He excelled as a teacher in both departments and his many contributions to surgical literature are specially valuable for the exact anatomical knowledge which characterizes them. The professor has been dean of his faculty during an active period of reconstruction and expansion which has put Toronto in the van of medical progress, indeed, it is not too much to say that his influence on medical education has radiated over the whole of the North American Continent. It was in recognition of his conspicuous services with the Canadian Contingent during the War that he was created Commander of the Bath. The Senatus desire to confer a higher and drier title on one who has so worthily maintained the best traditions of his profession in the great Dominion of the West."

Addresses were presented to the Vice Chancellor from the Universities of McGill, Leyden, Toronto, Pennsylvania, Copenhagen, Oslo, Paris, Oxford, Cambridge, Ireland (National), Wales, St. Andrews, Aberdeen, London, Birmingham, Bristol, and Leeds.

After the graduation an address was delivered by Sir George Newman, who surveyed the facts leading up to and influencing the foundation of the Faculty of Edinburgh. He traced the flow of culture from the primitive school at Salerno, through Bologna and Padua, the prototypes of Leyden and Edinburgh. The revival of the Hippocratic tradition came in with the life and labour of three men—Harvey, Sydenham, and Boerhaave. Boerhaave's classroom at Leyden was crowded by men of every

† The Edinburgh School of Surgery, Alex Miles, F.R.C.S.

land, but 25 per cent came from Great Britain. Boerhaave established a system of medicine, and that system formed the foundation of the Edinburgh Medical School. He referred to some of the remarkable discoveries which had taken place within the walls of the Medical School. Goodsir on the cell theory, Gregory on morphia, Hughes Bennet on leucocythæmia, Laycock on psychology and preventive medicine, Simpson on the anæsthetic properties of chloroform and Lister on antiseptic surgery.

A commemoration service was held at noon in St. Giles Cathedral, where the Medical Faculty and Senatus went immediately after the graduation ceremony. The Very Rev. Professor W. P. Paterson, Dean of the Faculty of Divinity, preached from the text Psalm 19, verse 4, "Their line is gone out through all the earth, and their words to the end of the world." He referred to the 16,000 graduates that the Medical Faculty had equipped and sent out during the 200 years of its existence.

The service at St. Giles was followed by a lunch at the College of Surgeons and in the afternoon, the new Surgical Research Department was formally opened by Sir John Gilmour, Secretary for Scotland. The principal referred to the assistance they had received from the Rockefeller Foundation of New York which secured certain improvements in the teaching of surgery and enabled the professor to devote more time to the students.

A dinner in the evening at the Royal College of Physicians followed by a garden party in the Arboretum given by the Lord Provost and Magistrates of the city completed the programme.

GEORGE GIBSON

THE RESIDUAL EFFECTS OF WAR GASES

To the Editor:

The Director of the U. S. Veterans' Bureau has appointed a board of physicians to study the residual effects of war gases. The members of the board are: Dr. A. K. Krause, Associate Professor of Medicine, Johns Hopkins University Medical School. H. L. Gilchrist, Lt. Col. M.C., U.S. Army; Chief, Medical Research Division, Chemical Warfare Service. Dr. Philip B. Matz, Chief, Medical Research Subdivision, U. S. Veterans' Bureau. The study will necessitate the investigation of the present or recent condition of upward of 70,000 ex-service men of whom there are hospital records of having been gassed. Because of the uncertainty which

still exists concerning the more permanent disturbances that may be attributed to gassing received in the war, the importance of such a study with the large amount of material available is obvious. It is felt by the members of the board that the opinions of clinicians of large experience and others who have been particularly interested in the subject can assist it greatly in solving what it feels is really a very difficult medical problem.

The board is not concerned with the better known and more immediate effects of war gases. It particularly desires information on the following points:

1. Does any war gassing received in action result in disability which is relatively lasting and permanent?
2. Does it cause lasting anatomic (pathological) changes, with or without disturbance of function (symptoms and disability)?
3. What organs or systems may thus be permanently affected or disturbed?
4. What symptomatology may exist under these circumstances?
5. If war gassing does produce relatively permanent effects, may a similar condition or conditions be produced by other agencies (diseases such as influenza, tuberculosis, effort syndrome, etc.)?

The term "lasting" or "permanent", as used above, means such late residual or remote changes that continue down to the present time and are appreciable.

The Board will appreciate your co-operation in the projected study in the way of any information, which you may be able and willing to contribute to it out of your personal experience. It will welcome your own impressions and first-hand opinions on the above points, and thank you for conveying these to it. Of course, it is understood that remarks are for official use and not to be used in any other way unless with your consent.

The Board will also appreciate receiving from you two reprints of any article which you may have written on the subject in question.

Very truly yours,

E. O. CROSSMAN,
Medical Director,

Washington, D.C.

United States Veterans' Bureau.

EXTRACT FROM LETTER TO DR. M. T. MACKLIN,
PUBLISHED BY PERMISSION OF THE WRITER.

Dear Doctor,

A woman, Mrs. R., who has come under my observation, has a marked deformity (clubbing) of left foot. She has six normal children; the oldest, now a young man, is married and has four children, the oldest of whom, a male, has a club foot. The second child, also male, had

a club foot; third, a female, normal, and fourth, a male, normal.

I thought this case might be of interest to you as Benard states if the first is normal the rest of the children will be normal, and the heredity of the affection arrested, but in this case it appeared again in the second generation, although the children of the first family were all normal.

Yours fraternally,

(Signed) W. W. BUTTLE

Pakenham, June 28, 1926

Medical Societies

HALIFAX BRANCH, MEDICAL SOCIETY OF NOVA SCOTIA

A special meeting of the branch was held on the 9th of June, convened to hear Dr. Leonard Murray, of Toronto, and Dr. Frank Patch, of Montreal, who visited the Halifax and other branches of the Medical Society of Nova Scotia in furtherance of the Canadian Medical Association scheme for extra-mural post graduate instruction. Dr. Philip Weatherbe, the newly elected president, was in the chair, and Dr. Victor Mader made his first appearance as secretary.

Dr. Murray dealt very comprehensively with the subject of cardio-vascular syphilis. After referring to the prevalence of syphilis, he stated that in 90 per cent of untreated cases the aorta becomes involved, and that 50 per cent of all cases of aortic mischief are due to syphilis. The coronary arteries, the cerebral arteries and the myocardium are particularly apt to suffer. Myocarditis probably develops to a greater or less extent in all syphilitics, and if arterio-sclerosis, hypertension, acute and chronic infections and toxæmias can be excluded, a diagnosis of myocarditis warrants the suspicion of syphilitic infection. As is the case with rheumatic fever, syphilis produces progressive disease of the myocardium, while other causes produce a static condition. Syphilis does not cause mitral stenosis, and rarely causes aortic stenosis. Many anginal attacks in young persons are consequent upon syphilis. In syphilitic aortitis, the pathological changes are in the media and ad-

ventitia; the intima escapes. Aortitis may or may not lead to aneurism or aortic insufficiency. Aneurism is recognized with difficulty until it has progressed to an extent which makes the prognosis very bad. The signs are projectile pulsation under the screen, more marked on the right side, pulsation in second and third interspaces, rarely detected until aneurism is large, transverse dullness, in second right interspace, which may be found also in mediastinal tumours or acute myocarditis; a difference in volume of the radial pulses, which also may result from other conditions; tracheal tugging; laryngeal symptoms and changes in the lungs. Inequality of the pupils is a sign of tabes rather than of aneurism. Diffuse aortitis, the most common of the syphilitic lesions of the vessels and the cause of many sudden deaths after exertion in young people, is seldom if ever recognizable during life. In the treatment, exercise of the most careful judgment is essential. In early cases, active antiluetic measures are indicated. In old cases, iodides and mercury are to be preferred to the newer drugs.

Dr. Patch discussed renal infection. He maintained that perinephritic abscess is secondary to infection of the kidney, while paranephritic abscess is secondary to infection of the bowel. Such infections may be through the blood stream, penetration of the kidney capsule, direct extension from the pleura, or from infected glands at the hilus. These abscesses may point at the obturator foramen, or the groin, in the lower intercostal spaces, or under the peritoneum,

at the umbilicus. The organisms most commonly concerned are members of the colon group. Liability to infection is increased by retention, congestion or trauma, retention being the most important. Referring particularly to acute pyelitis, after reviewing the classical symptoms, Dr. Patch said that in children pyuria may be the only sign. Cystitis is too often diagnosed. The presence of pus in the urine of children calls for the same investigation as in adults. Acute pyelitis may follow catheterization in old prostatitis. Chronic pyelitis may come on insidiously in old patients, or may follow an acute pyelitis. In the treatment of either acute or chronic pyelitis, the cause should have careful consideration. Very commonly the removal of obstruction is of first importance. Foci of infection should be looked for, and, if discovered, have appropriate treatment. The value of such drugs as urotropin and capracol has been overestimated.

Dr. Murray's paper was discussed by Drs. M. Chisholm, Nicholls, K. A. MacKenzie, Mack, and Birt, while Dr. Patch's paper was discussed by Drs. Mack, Smith, Hogan and Burris. Both papers were exceedingly practical and comprehensive. Dr. Patch illustrated his address with a number of carefully selected slides. Upon motion of Drs. Birt and Corston a very hearty vote of thanks was tendered the speakers. W. H. H.

MEDICAL SOCIETY OF NOVA SCOTIA

The seventy-third annual meeting of the Medical Society of Nova Scotia was held at Halifax on the seventh and eighth of July. Dr. E. V. Hogan presided. The attendance was unusually large, and a great number of matters which were of pressing interest to the profession came up for discussion. The several committees presented very satisfactory reports, and the financial situation was found to be highly gratifying.

In his presidential address, Dr. Hogan gave an admirable résumé of the activities of the past year, and recommended *inter alia*, that the Society should endeavour to have the medical officer of the Workmen's Compensation Board made a member of that board, and to have the position of physicians in relation to the Temperance Act made acceptable to the profession. He also recommended that suitable arrangements should be made to adequately

celebrate, next year, the fiftieth anniversary of Dr. John Stewart's entrance into the profession; and that consideration be given to a permanent policy relative to the publication of the *Nova Scotia Medical Bulletin*. Effect was given to these recommendations. Of particular interest was the decision of the Society to raise a fund of \$50,000.00 to endow a chair at Dalhousie University, to be known as the John Stewart chair of surgery. It was unanimously decided to continue the *Bulletin*, and in furtherance of this object Dr. Smith L. Walker was appointed assistant secretary of the Society and secretary to the editorial board.

Dr. Frank H. Leahy, of Boston, gave the address in surgery. He chose as his subject the combined medical and surgical treatment of gastric and duodenal ulcers. He pointed out that careful follow-through of operations on the stomach and duodenum had shown that the ultimate results are much less favourable than is generally believed, and that, on the other hand, carefully controlled medical treatment aimed at the neutralization of acidity removed the need for operation in a large percentage of cases. Dr. Leahy's very frank and fair presentation of his facts and beliefs was greatly appreciated.

The address in medicine was assigned to Dr. Joseph H. Pratt, of Boston. He spoke on the influence of Osler on the practice of medicine, and gave a most delightful sketch of his life and work.

Dr. A. F. Miller, of Kentville, dealt with the treatment of pulmonary tuberculosis by means of artificial pneumo-thorax, and showed by charts and x-ray films, that excellent results have been obtained by the method as followed at the Nova Scotia Sanatorium. Dr. Miller expressed the opinion that this treatment could be very well given outside sanatoria. He was followed by Dr. H. K. MacDonald, who considered the more serious operations of phrenectomy and thoracoplasty, citing his experiences and indicating the types of cases which are likely to be benefitted by these procedures.

Perhaps the most enjoyable feature of the scientific part of the programme was the clinic at the Victoria General Hospital, conducted by Dr. Leahy with comment on special points by Dr. Pratt. Several cases illustrating different

types of goitre, a case of carcinoma of the rectum, one of splenic anaemia and one of gall stones were exhibited, and the salient points in diagnosis and treatment were admirably presented.

All the papers were greatly enjoyed and well discussed. The discussions on matters affecting professional interests were spirited and brought out a variety of opinions, but were carried on without acrimony and led to the correction of several misunderstandings. A resolution protesting against the embarrassing position in which recent temperance legislation has placed the profession was passed with few dissenting voices.

The entertainment programme was well arranged and carried through in splendid fashion. On the afternoon of the first day, the visiting ladies were motored along the shores of Bedford Basin and the Waverly and Dartmouth lakes to the Brightwood Golf and Country Club, where they were joined by the men for tea, golf and dancing. On the second afternoon, all were most hospitably entertained at the beautiful summer home of Dr. Evatt Mathers, on the North West Arm. The final session took the form of an informal dinner at the Ashburn Golf and Country Club, which proved to be particularly enjoyable.

The new officers are: President, Dr. John J. Roy, Sydney; vice-presidents, Drs. L. R. Morse, Lawrencetown, and H. K. MacDonald, Halifax; secretary-treasurer, Dr. J. G. D. Campbell, Halifax; assistant secretary, Dr. Smith L. Walker, Halifax. Drs. Roy, Campbell and Walker, *ex officio*, together with Drs. W. J. Egan, Sydney, L. R. Morse, Lawrencetown, E. D. MacLean, Truro, O. B. Keddy, Windsor and Ross Miller, Amherst, were appointed to the Council of the Canadian Medical Association. Dr. H. B. Atlee was added to the editorial board for Nova Scotia of the *Canadian Medical Association Journal*. Drs. G. H. Murphy, J. G. MacDougall and H. K. MacDonald, Halifax, G. W. T. Farish, Yarmouth, J. W. Smith, Liverpool and John MacDonald, Sydney, were elected to represent the society on the Provincial Medical Board.

The next annual meeting will be held at Sydney.

THE ANNUAL MEETING OF AMERICAN OTO-LARYNGOLOGISTS

At the combined meeting of the American Otological, Rhinological and Laryngological Society and of the American Otological Society held in the Biological Building of McGill University, Montreal, June 2, 1926, two lectures were given by special invitation. Professor R. Magnus, Professor of Pharmacology at the Imperial University, Utrecht, Holland, who was the guest of honour at this meeting delivered the first address.

On the Co-operation or Interference of Reflexes from Other Sense Organs with Those Evoked from the Labyrinth.

The address was a concise review of some of the more recent work of the Utrecht School. The main factors he said concerned in the reflex maintenance of posture may be classified into the following groups: (a) The labyrinthine righting reflexes. (b) The eye righting reflexes. (c) The neck righting reflexes. (d) The body righting reflexes. Copies of a very comprehensive table of reflexes were at the same time given to the members present.

In the normal animal the head is maintained in a steady position in order to keep the eyes horizontal; any movement of the head that does occur is allowed for by a reflex adjustment of the eyes. This steadiness is maintained and any adjustment effected by the labyrinth; if one labyrinth is removed the head and eyes are immediately deviated to one side. If the normal animal is held free in the air the head is held in the normal upright position no matter how the body or pelvis may be rotated. On the contrary, if a delabyrinthized animal with the eyes bandaged is held free in the air, the head follows the movement of the rest of the body. When the otoliths are removed by centrifuging, the righting reaction on the head and eyes in the air is lost, so that the otolithic apparatus would appear to be responsible for this righting reflex and not the semi-circular canals. When experimenting with a cat or dog the eyes must be covered for when held free in the air with the eyes covered the head is not righted, but the moment the covering is removed the head is righted owing to the eye righting reflex on the head. Lantern slides were shown to demonstrate this experiment.

After unilateral labyrinthectomy there is a turning of the head so that the snout points towards the opposite side of the body, and there is also a diminution of tonus in the limbs on the side of the labyrinthectomy. It was found that if the turning of the head was corrected, the difference in tonus almost disappeared. That this tonus difference is due to the turning of the head on the neck can be shown by the fact that the same thing occurs in a delabyrinthized animal, the tonus is increased in the limbs toward which the snout is turned. It was further pointed out that dorsi-flexion of the head in the rabbit produces extension of the fore and hind limbs whereas in the cat and dog dorsi-flexion causes an extension of the fore limbs and flexion of the hind limbs. This is well seen in the attitude adopted by a cat when looking at something above its head; ventri-flexion of course causes the opposite effect. The neck reflexes on the eyes can be shown by fixing the head of a normal or of a delabyrinthized animal and then rotating the body to one side or up or down. If the body is brought over to the right the eyes move round to the left, *i.e.*, always opposite to the movement of the body. These are some of the neck reflexes.

The body righting reflexes were demonstrated by holding the delabyrinthized rabbit free in the air on its side, and of course the head was not righted but remained on the side. The animal was slowly lowered to the table and the moment the body touched the table the head was righted. To show this is due to asymmetrical stimulation on the body, the animal was placed on its side on the table and a light board was placed on the upper side to make contact. The head was lowered into the side position and when the board was removed the head was again raised when the stimulation was accentuated. The effect of the body righting reaction on the body was demonstrated by holding a normal rabbit in the lateral position in the air, the head also being held in the side position, then the body is lowered to touch the table but the head is firmly held in the side position, and in spite of this the pelvis is righted at the moment of contact. So that here we have seen the body righting reaction on the head and on the body.

Summary.—The position of the eyes is controlled by the labyrinthine reflexes. The semicircular canals, which are stimulated by sudden movement, initiate rapid movement of the eyes which are maintained by the various co-operating reflexes just described. The labyrinth together with the eye and body righting reflexes tend to maintain the head in a steady upright position; then all movement of the body tends to cause a turning of the head on the neck which gives rise to the tonic neck reflexes so much concerned in the maintenance of tone in the musculature of the body and limbs in the reflex control of posture.

The Second Address was Delivered by Professor John Tait, Moiley-Drake Professor of Physiology, McGill University, on "Ablation Experiments of the Labyrinth of Frogs," and was illustrated with experiments by Dr. W. J. McNally.

As an introduction to a discussion of the function of the vertical semicircular canals, the sacculus and utricle were first briefly dealt with. It was pointed out that in the frog the saccular macula exerts no control over the equilibrical reactions of the body or limbs (the eyes were not examined). After section of the nerve to one or both saccular maculae the animal is to all intents and purposes normal. The utricular macula is the main organ of static equilibrium. An animal with all six semicircular canals destroyed still reacts normally to gravity, *i.e.*, if the animal is slowly tilted out of the horizontal plane it makes all the proper adjustment of the limbs to prevent itself from falling down the board. But this animal does not respond normally to any sudden movement (acceleration). If the utricle was injured during an operation the animal assumed permanently the forced position so well known following unilateral labyrinthectomy. It has so far proven impossible to control these experiments by removing one or both utricles leaving the other labyrinthine structures uninjured.

The semicircular canals are the organs for kinetic equilibrium, they respond to sudden movement. As suggested by Prof. Magnus in the previous lecture when discussing the relation of the semicircular canals and the eyes, the semicircular canals initiate the immediate response to the sudden movement and the new attitude is

maintained by the utricles and other co-operating reflexes. It was found that this same relation exists between the canals and the limbs. The horizontal canals are stimulated by turning about a vertical axis (the relation to the gravitational field is unaltered). The frog responds by turning in the opposite direction in order to counteract a torsion effect on its body. A frog with the right horizontal canal destroyed was demonstrated to show the absence of any response to turning to the right. The vertical canals are stimulated by turning about a horizontal axis, that is, any sudden movement out of the horizontal plane stimulates the vertical canals. When a normal frog is placed diagonally on the tilt-table and is suddenly tilted forward there is a rapid outward thrust of the limb at the forward corner of the body. It was noted that if an animal with one vertical canal destroyed, was tilted in the plane of the injured canal (for an anterior canal forward) the corresponding limb was not thrust out as described for the normal, so the frog would be thrown from the board. If not thrown from the tilt-table it would lurch over, but now it would be out of the horizontal plane so the gravity effect comes into play and the animal picks itself up and assumes the proper attitude, this delayed response is probably from the utricule. An animal was demonstrated in which the right posterior vertical canal was destroyed and when tilted backward the left hind limb was rapidly extended but not the right. In this case the rapid response to sudden tilting is lost in the corresponding limb (right posterior limb). It was suggested that this same principle may hold in man, for instance when one trips or stumbles the arm is unconsciously thrown out to prevent a fall. This may be reflex from one of the vertical canals. In the case of the frog, it is possible by using the tilt table to detect a lesion of the individual vertical canals. With this idea in view a tilt-table has been constructed for testing patients. So far only cases of complete destruction of the labyrinth have been tested. A case of acquired deaf-mutism was demonstrated to show the loss of protection against a sudden tilt on the table. If routine examinations were carried out in a series of oto-neurological cases certain lesions of the individual vertical canals or their central connections might be detected.

Summary.—In the frog section of one or both

saccular nerves cause no disturbance of equilibrium. The utricular macula is the organ of static equilibrium and is stimulated by any movement out of the horizontal plane. Its injury causes a forced position. The semicircular canals respond to any sudden movement. The horizontal canals are stimulated by movement about a vertical axis (no change with regard to gravity). The vertical canals are stimulated by all sudden movements out of the horizontal plane and they initiate a rapid protective movement of the limbs and body and the resulting position is maintained by the utricule and the other co-operating reflexes.

W. J. McNALLY

RESISTANCE TO INFECTIOUS DISEASES

At a meeting of the Edinburgh Medico-Chirurgical Society, held in the Hall of the British Medical Association Scottish Headquarters on May 5th, with the President, Professor Russell, in the chair, Dr. A. James read a paper on the power of resistance to infectious diseases.

Dr. James said that in the development of disease two factors were at work—the virulence of the infection and the resistance of the patient, or the store of constitutional strength and fitness in relation to environment possessed by the individual. He wished to consider the second factor with reference to infectious disease; it was quite obvious that a good constitution was not enough, for a strong, healthy man from the country might quickly succumb to an infection received in a town. A child brought up in a town might resist certain infections, and the question to be considered was: did this power of resistance to one particular infectious disease operate against other infectious diseases, and if so, to what extent? In order to study this Dr. James had collected 918 cases of scarlet fever, 610 cases of diphtheria, 238 cases of measles, and 111 cases of diphtheria carriers, all over six years of age, and examined their histories. The infectious diseases of 1,000 school children were also studied and the results tabulated. His tabulation showed that the proportion of those who had had no previous infectious disease was high in measles and low in diphtheria. Since measles was a very common disease this might seem to show that those who could resist

measles could resist other diseases better than their fellows. To study constitutional fitness the cases were divided according to their severity into two groups and the number of previous infectious diseases recorded for each group. Of 918 cases of scarlet fever, 877 were mild or moderate, 41 severe and fatal. In the group of mild cases the number of previous infectious diseases was 1.73 and for the severe cases 2.12. Furthermore, in the second group there was no case without a history of previous infectious disease. Other diseases gave similar results. Dr. James described a case to illustrate the particular susceptibility of certain individuals. A boy, aged seven, was admitted to hospital suffering from measles; he contracted

successively diphtheria, scarlet fever, and chicken-pox, while all the others in the wards he visited remained free. The speaker suggested that if one generation received adequate medical treatment there should be less needed in the succeeding generation. The figures showing that the demands for hospital beds had risen out of all proportion to the increase of the population proved that this was not so. Dr. James suggested that the doctor was not to be blamed for this, but rather the politician in his eagerness to correct the tardiness of Providence in improving the health of the community.—*Brit. Med. Jour.*, June 5, 1926.

Abstracts from Current Literature

MEDICINE

The Seasonal Variation in the Onset of Acute Diabetes. The Age and Sex Factors in 1000 Diabetic Patients. Adams, S. Franklin, *Arch. Int. Med.*, June, 1926.

The patients studied came from the middle northern states and from middle southern Canada. More than half came from rural districts. From September till March occurred the greatest incidence of acute diabetes.

A more sedentary life and a greater incidence of acute respiratory infections during this period suggest a combination of circumstances favourable for the precipitation of diabetes.

Diabetes is a disease that gradually increases in incidence with age up to sixty, after which there is a sudden decline, due probably to the falling off of the population of persons over sixty.

LILLIAN A. CHASE

The Graphic Presentation of the Blood Sedimentation Test: A Study in Pulmonary Tuberculosis. Cutler, J., *Amer. Jour. Med. Sc.*, June, 1926, clxxi, No. 6.

In the tuberculous patient, it is very difficult to estimate the pathological activity of the lesion and, consequently, to regulate rest and exercise. The blood sedimentation test, which

formerly involved an elaborate technique, has been simplified by the author, and the results obtained have been studied as an indication of the pathological activity in cases of pulmonary tuberculosis, and shown to be of clinical value.

The cause of this hastened settling of the blood cells in infectious diseases is unknown, but the reaction depends, apparently, upon the degree of cellular destruction going on in the body. The rapidity with which the cells settle is variable, and a record of the rapidity presents by the graphic method, information regarding the amount of pathological activity still present in a lesion.

The only special apparatus required for the test is a sedimentation tube graduated into tenths of a cubic centimeter, each of which are one millimeter in height and marked in millimeters. (These tubes may be obtained from A. H. Thomas Co., Philadelphia). In obtaining blood for the test a 5 c.c. syringe is used. Half a cubic centimeter of a 3 per cent sodium citrate solution is first taken into the syringe, and then blood from the cubital vein is drawn up to the 5 c.c. mark. The syringe is tilted gently back and forth a few times and its contents expelled into the sedimentation tube. The position of the sedimenting column is read every five minutes for one hour, and the readings in

millimeters plotted against time, on graph paper or a specially prepared chart.

From the nature of the graph, together with the clinical evidence, the author correlates two lines and two curves with the activity of the tubercular process: a horizontal line indicating a healthy individual; a diagonal line indicating clinically quiescent tuberculosis; a diagonal curve indicating clinically slightly active tuberculosis; and an almost vertical curve is regarded as indicating active tuberculosis. The sedimentation index and sedimentation time also give valuable information. By the term "sedimentation index" is meant the total sedimentation of cells at the end of sixty minutes, expressed in millimeters; the average in health being for males 3 to 4; and for females 5 to 6. The term sedimentation time indicates the number of minutes that elapse before the period of the packing of the cells sets in; *i.e.*, cessation of sedimentation; this in health is a matter of some hours. Thus, the graph gives a rough estimation of the presence or absence of pathological activity, while the sedimentation index and sedimentation time help to determine the degree, *i.e.*, the greater the sedimentation index, and the shorter the time, the greater is the pathological activity; the smaller the index and the longer the time, the less is the pathological activity.

Results are recorded of observations on seventeen healthy individuals and on sixty-five cases of clinically active tuberculosis, in which the clinical findings and progress were correlated with the observations of repeated blood sedimentation tests. It is pointed out that in the apparently quiescent and quiescent groups the test findings range from the vertical curve to a horizontal line with the majority yielding diagonal lines. This absence of constant findings in quiescent cases is taken as proof of the value of the test, for patients with advanced lesions may appear quiescent clinically, when their symptoms are masked by a brief period of rest and treatment, and still may be pathologically active. The test indicates the amount of pathological activity, and may therefore be regarded as a better guide in prescribing rest and exercise than the temperature, pulse, constitutional symptoms or physical signs; all of which may be variable or absent. By repeating

the test at weekly intervals the progress of the case may be estimated.

The blood sedimentation test is a non-specific reaction, occurring in many infectious and destructive diseases, and, until further study is undertaken, its present value in pulmonary tuberculosis is limited to those cases which are uncomplicated by other diseases. C. J. TIDMARSH

Passive Anaphylaxis in a Hæmophiliac. Mills, C. A. and Schiff, Leon, *Amer. Jour. Med. Sc.*, June, 1926, clxxi, No. 6.

In the treatment of hæmophiliac patients, the method used by the authors is to sensitize the patient to horse or sheep serum by subcutaneous injection of three or four centimeters, and, ten days later by the intradermal injection of 0.22 c.c. producing a local skin reaction. As the local skin reaction appears, the clotting time promptly falls to normal, and any bleeding immediately ceases. The effect lasts for periods varying from one week to several months, and, as the skin reaction does not desensitize the individual, the reaction may be repeated as often as is necessary.

Using this method of treatment on a hæmophiliac boy with bleeding gums, it was found that sensitization did not follow the injection of horse serum. About five hours after the ineffectual intradermal injection, he received a transfusion of 800 c.c. of citrated blood from his brother-in-law, who was known to be sensitive to horse serum. One half hour later, a typical skin reaction developed at the site of the intradermal injection. The bleeding ceased as the reaction developed, and did not again recur.

There were no systemic disturbances attributable to a general reaction, and the case is regarded as one of passive anaphylaxis in which the boy acted as a passive receptor for the reacting agents. C. J. TIDMARSH

Relation of Abdominal and Rectal Infections to the Pathogenesis of Diabetes Mellitus. Visher, John W., *Amer. Jour. Med. Sc.*, June, 1926, clxxi, No. 6.

Assuming that the underlying cause of diabetes mellitus is, in many cases, a pancreatitis, the author discusses the relationship of infections of the abdominal viscera to pancreatitis and diabetes. Such infection may

reach the pancreas by direct extension, by ascending infection of the bile and pancreatic ducts, by the blood stream, by the portal vein, and by way of the lymphatics. The last route is considered the most important, and the anatomy of the lymphatics of the pancreas, together with the experimental physiology relating to this path are summarized.

The clinical evidence consists of five cases of diabetes, all of which had severe infections of abdominal viscera at the time of the development of diabetes, or in the recent past. Patients with duodenal ulcer, chronic cholecystitis, appendicitis with peritonitis, and rectal infections developed diabetes of varying degrees of severity, due in the author's opinion to an associated pancreatitis followed by fibrosis, reduced pancreatic function, and diabetes.

The author concludes that abdominal and rectal infections are important etiological factors in diabetes, and that the path of infection is along the lymphatic channels to the pancreas.

C. J. TIDMARSH

The Relation of Albuminuria to Protein Requirements in Nephritis. Peters, John P. and Bulger, Harold A., *Arch. Int. Med.*, Feb., 1926, xxxvii.

The general practice is to restrict protein in all cases of nephritis. An investigation of the non-protein nitrogen constituents of the blood in nephritis shows that retention of these waste products usually is an insignificant feature, especially in those cases characterized by oedema not due to cardiac decompensation. The theory that the end products of protein katabolism are renal irritants has furnished new pretexts for the continuation of low protein diets. The fact that the administration of excessive protein to a vegetarian animal results in the development of nephritis is no good evidence that ordinary amounts of protein will have a similar effect on an omnivorous animal.

Nephritis is a chronic disease. Treatment must be so regulated that it can be continued for an indefinite period. The patient must be insured against the effects of protein starvation. This is possible only if sufficient protein and carbohydrate are given. A negative nitrogen balance is often associated with a rising blood non-protein nitrogen. It is generally believed that the protein of albuminuria is derived

from the serum albumin to which the kidneys have become permeable. There is no reason for believing that the nitrogen of urine albumin plays any rôle in the normal protein metabolism.

Epstein believing that low concentration of plasma proteins was itself partly responsible for oedema, long since advocated high protein diets. Clinical observation convinced him that such diets were distinctly beneficial. Others believe that diets should contain an adequate, but not excessive, amount of protein. McLean and Wordley believe that the beneficial effects of high proteins is due to the diuretic effect of the urea formed from them.

The work here recorded by the authors was done to learn something of the nitrogen metabolism in nephritis; to establish more definitely the nitrogen requirements of the disease; to find out whether protein, lost as albumin, could be replaced; to study the effect of feeding on the level of the plasma proteins, the clinical aspects of the disease, and the chemical composition of the blood. Six cases were studied carefully in much detail.

Conclusions.—By proper regulation of diet it is possible to replace nitrogen lost as albumin. Most of the patients studied had undergone nitrogen starvation, due either to misplaced dietetic treatment, or to the fact that the disease itself is associated with an augmented nitrogen metabolism. Adequate fat and carbohydrate are essential factors in the production of low nitrogen katabolism.

Increasing dietary protein can then be expected to raise the non-protein nitrogen of the blood only if it raises the protein metabolism of the body. When such an increase contributes only to the restoration of depleted tissue it has not such an effect.

In the acute stages there is a high protein metabolism. Whether this can be controlled or not is undetermined; it is reasonably certain it can be favourably influenced. The cases studied, with a possible exception, had an infectious origin, or began immediately after a definite infection. Urines contained red blood cells, leucocytes, casts, and albumin. The blood pressure and non-protein nitrogen of the blood were slightly elevated. With one exception none of them could have been admitted into the group which Muller, Epstein, Volhard and Fahr have called nephrosis. But they presented the tend-

ency to œdema, profuse albuminuria, and reduction of plasma proteins. In all the infectious cases, as the acute stage subsides, hæmaturia, hypertension, and azotemia diminish.

Low basal metabolism may be another expression of the undernutrition exhibited in the nitrogen metabolism.

LILLIAN A. CHASE

The Therapeutic Use of Diets Low in Water and in Mineral Content. Keith, Norman M., Smith, Florence H., and Whelan, Mary, *Arch. Int. Med.*, April, 1926.

The object of the author's paper is to show that a diet low in mineral and in water content is a useful therapeutic measure, that important quantitative data can be thus obtained, and that after its continuation for several months there is no apparent evidence of diet deficiency. Such a diet has been used by them in their hospital for the last two years, and has proved a most effective adjunct in the treatment not only of cases of obstinate œdema due to nephritis, but also of those of persistent ascites due to hepatic and cardiac disease.

It was their experience, in cases of obstinate œdema due to renal disease, to find manifested usually an inability to excrete both chlorides and water, and thus the so-called salt free diet failed to produce diuresis and loss of œdema. By analysis they found that the routine salt free diet contained a small quantity of chloride, from 2 to 3 gms., but from 1,200 to 1,400 c.c. of water. This amount when added to that ingested as fluid, from 600 to 1,000 c.c., made the daily intake from 1,800 to 2,400 c.c.

In regard to the type of diet used, the basis contained 20 gms. of protein and to this was added food containing complete proteins to make up to 40 gms., and carbohydrates and fats to produce 1,500 calories. The foundation or basis of 20 gms. of protein was made up from 800 gms. of fruits and vegetables, 100 gms. of bread, and 20 gms. of dry cereal. The 1,500 calories was considered a basal diet for the average patient. The actual fluid ingested over and above that in the food was from 600 to 800 c.c., daily, making a total fluid intake of from 1,400 to 1,600 c.c. If patients were up and about, they were given diets of approximately 2,000 calories daily. The protein content was not increased, but extra fats and carbohydrates were added.

On the above diet, chemical analysis showed an excess excretion of chlorine and sodium above that ingested, thus proving to the authors the therapeutic value of the diet.

They have used this diet in eight cases of subacute or chronic nephritis with marked œdema, and twenty-five cases of chronic ascites with liver disease and cardiac insufficiency. In many of the cases satisfactory diuresis was produced by the combined use of the diet, ammonium and novasurol. Several of their patients found it necessary to remain on this diet for a period of three months and no ill effects were noted.

Their summary is as follows, "carefully controlled diets of low mineral and water content are both practicable and effective in the treatment of cases of œdema and ascites. The diets may be varied in protein and caloric value with little increase in mineral or water content. There have been no demonstrable ill effects from the continued use of these diets."

L. C. MONTGOMERY

SURGERY

Tuberculosis of the Mammary Gland. Shipley, Arthur M., and Spencer, Hugh R., *Ann. of Surg.*, February, 1926.

A review of the literature serves to emphasize the infrequency of mammary gland tuberculosis. Various authors report its frequency as being all the way from 0.6 per cent to 2.5 per cent of all benign lesions. Of 180 cases collected by Anspach, Deaver and Elkin, 120 were regarded as primary in the breast, and 70 per cent of Deaver's cases were between the ages of twenty and fifty years.

There are three types, the nodular or discrete, the confluent, and the sclerosing. The lesions are unilateral and confined to one quadrant, the upper and outer, and the axillary lymph-nodes are involved in 60 to 70 per cent of cases. (Gatewood). In the nodular and confluent types a more or less acute process may be noted with redness of the skin, fluctuation and sinus formation. In the sclerosing type the lesion is firm and irregular and distorts the breast. On section there is a diffuse fibrous mass with little caseation. It occurs in older women and is difficult to differentiate from malignancy. Retraction of the nipple and pigskin may be seen, but the chronicity of the case together with a tend-

ency to softening, leads to the correct diagnosis. The lymph nodes along the pectoral and in the axilla are not so hard as in malignancy.

The histological picture is usually adequate for a diagnosis. Bacteriologically the organisms are found with difficulty, and guinea-pig inoculation may be necessary.

A report of ten cases is given. R. V. B. SHIER

Carcinoma of the Right Segment of the Colon.

Mayo, C. H., and Hendricks, W. A., *Ann. of Surg.*, March, 1926.

After a general discussion regarding the advance of surgery in the treatment of carcinoma, the authors consider the disease as it attacks the cæcum and ascending colon.

The Roentgen ray is now an important factor in diagnosis of a neoplasm in the alimentary tract. In the colon the disease is seen late in many cases. This is particularly true of the right colon because of its liquid contents, and the fact that blood-stained mucus in the stools is less common.

When surgical removal is attempted the right segment of the colon, together with the terminal ileum should be removed. One would think that the liver should be affected early in this disease on account of the portal drainage. Such is not the case. So perfect is the filtration system of the right bowel that carcinoma cells are not allowed to pass. There are few lymph nodes along the colonic drainage system. These may be enlarged in cases of carcinoma from inflammatory change only, especially if there is an ulcerating lesion present. If the bowel in the area involved is moveable a resection should be done, making an anastomosis of the terminal ileum to the transverse colon. Of all the methods of anastomosis the authors prefer an end-to-side, and state that here is an ideal situation for the use of a Murphy button. A catheter may be inserted into the bowel by the Artzel method to relieve gas tension. The authors incorporate the cut end of the colon in the peritoneal suture, and protect the end with gauze. If need be this may be punctured and a catheter inserted to relieve gas tension. R. V. B. SHIER

Acute Osteomyelitis in Children. Farr, C. E., *Ann. of Surg.*, May, 1926.

Acute osteomyelitis is due to a blood-borne infection of pus-producing organisms, usually

staphylococci and streptococci. The relationship of trauma and the blood-borne infection is a disputed point; the weight of evidence seems to show that in many cases the child falls owing to the pain induced by the sudden onset of the acute infection. The records of the author show that in about one-third of the cases is there a history of trauma, but in no case is there evidence of local injury to skin or soft tissues. The infection usually starts in that portion of bone best protected and centrally located.

The exact conditions for acute osteomyelitis, that is, a young animal susceptible to a strain of staphylococci, which has produced osteomyelitis in the human, are difficult to reproduce. The pathology is that of any suppurative inflammation with bone as the tissue involved. The constitutional and local signs are those of any severe infection.

The differential diagnosis is not easy. Articular rheumatism is a common diagnosis. The exquisite tenderness, the redness and local heat, the increase in the systemic temperature, the high blood count and differential, the rapid pulse and the great prostration should be sufficient to establish a diagnosis. X-ray pictures during the first ten days are of no value.

Farr divides the cases into several types, fulminating, severe acute, acute and mild types. The fulminating cases rapidly succumb as a rule. In the severe type a simple drainage operation is performed in either one or two stages. The one-stage procedure is to open down through the soft parts and into the bone. The two-stage is to pack the soft parts for from twelve to twenty-four hours, and then open the bone. In the ordinary acute form the bone is opened by chiselling the cortex away, but rarely is it advisable to curette the bone marrow.

The after treatment requires attention to detail. Cleansing with mild antiseptics, splints if the bone is greatly weakened, and blood transfusion if an anemia exists, are in order. The period of disability is long and its length will depend on the location of the affection and on the thoroughness of treatment. R. V. B. SHIER

Technique for Use of Removable Radon Seeds in Carcinoma of the Tongue. Muir, J., *Ann. of Surg.*, May, 1926, lxxxiii, 598.

This article described a new technique of

radium therapy in lingual carcinoma which offers a practical means of irradiating even the most inaccessible tongue lesions. This is accomplished by the implantation of removable platinum radon seeds.

The various methods by which lingual carcinoma has previously been treated are discussed and their advantages and drawbacks considered. Imbedding of bare tubes according to Janeway's method affords an even distribution of radiation, but causes necrosis which is invariably followed by sloughing and may even induce unavoidable fatal hemorrhage. If screened seeds are used, necrosis is avoided, but they are objectionable because they must remain in the tongue as foreign bodies. The platinum needles advocated by Regaud also obviate necrosis and can be removed when radiation has been accomplished, but proper distribution of these applicators is very difficult; they cause too much trauma; and above all, they are hard to immobilize and cannot be placed upon the posterior dorsal surface of the tongue.

The method offered in this article obviates all these difficulties, while retaining every desirable feature. The seeds are completely screened with platinum, thus doing away with necrosis and sloughing; they are easily withdrawn after adequate dosage has been delivered, so that they do not remain in the tissue as foreign bodies. These seeds can be placed in any position required, just as readily in the hitherto inaccessible "root" of the tongue, as in more favourable positions. The article is profusely illustrated, demonstrating the exact method of approach to these inaccessible lesions.

The growth is first carefully palpated, and the number of seeds required determined according to its depth and surface extent. When a seed has been placed in the desired position, the attached thread is left protruding from the point of entry, where it is cut off so as to leave just enough to be readily grasped with forceps at the time of removal.

The entire treatment causes no pain, and but slight inconvenience to the patient; and when skilfully performed under proper aseptic precautions, the technique offers an excellent means of solving one of the most vexing of clinical problems.

AUTHOR'S ABSTRACT

Pruritus Ani: Treatment by Alcohol Injection.

Stone, H. B., *Surg., Gyn. & Obst.*, April, 1926.

This is a further report on a method described in 1916 (*Johns Hopkins Hosp. Bull.*, 1916, xxvii, No. 306). It is suggested for the treatment of the "idiopathic" type of pruritus, ranging from the slight and persistent to the type which is so severe as to endanger general health.

The patient is given a general anæsthetic; local anæsthesia interferes with the infiltration to be carried out. After routine preparation, the area of skin affected is injected with alcohol, 95 per cent grain alcohol being used. The injection is done with small fine hypodermic needles, which are plunged vertically into the subcutaneous tissue; two to four drops of alcohol are injected each time and the punctures are spaced about one-quarter inch apart over the entire area involved. The injections are carried up to within one-half inch of the canal margin, but are not made within the canal itself. The scrotum, labia majora and folds of the groin have been injected without difficulty. The skin is then sponged off with alcohol; no dressing is applied. There is a little after soreness but the itching is entirely abolished. Sloughing may result if too much alcohol is injected at one spot, or if it goes into the skin alone. The degree of relief varies. The treatment has been used for over ten years in the rectal clinic of the Johns Hopkins Hospital, and whilst a large proportion of cases show a tendency to recurrence within six to twelve months, there have been a number in which there has been relief for several years. Apparently the injections may be repeated as often as is necessary.

H. E. MACDERMOT

PÆDIATRICS

Lead Poisoning in Nursing Infants.

Wilcox, H. B. and Caffey, J. T., *Jour. Am. Med. Ass.*, May 15, 1926.

Lead poisoning in the nursing infant is not an extremely rare occurrence. It may even be found congenitally when the mother is suffering from plumbism, or the infant may ingest lead which is excreted in the maternal milk, as when the mother has been using cosmetics and hair dyes containing lead. Lead lotions and ointments are sometimes applied to diseased nipples and supply an obvious source from which the baby may obtain the metal.

The authors report two cases of lead poisoning in nurslings caused by lead nipple shields, which are now extensively used to protect the nipples. Both infants were breast-fed entirely, and the mothers had used the shields for several months, and admitted being somewhat careless in washing off the nipples before nursing the baby. In neither case did the mother show any evidence of lead poisoning. The chief symptoms presented by the infants were vomiting, nervousness, and anæmia which are in no wise suggestive of plumbism. None of the classic manifestations such as colic, palsy, or the lead line were present. The diagnosis was confirmed in each case by finding basophilic degeneration of the red blood cells, certain characteristic changes in the spinal fluid and the chemical detection of lead in the urine and fæces of the babies. The symptoms cleared up rapidly after removing the source of the trouble, although the anæmia persisted for long afterwards.

L. M. LINDSAY

ANÆSTHESIA

Present Position of Chloroform. (Presidential Address Delivered before the Scottish Society of Anæsthetists at Dundee) by Arthur Mills. *Lancet*, June 12, 1926, p. 1134.

Chloroform is still used in many operations in Dundee and its environments. "Chloroform deaths" still occur but are avoidable.

The dangers of chloroform fall into four groups:

1. *Depression of the respiratory centre.*—Chloroform dulls the sensibility of the respiratory centre. The depression is gradual in its onset and easily recognized. A careful administrator rarely permits this condition to become serious.

2. *Fall in blood pressure.*—This is due to stagnation of blood in the splanchnic area and in the capillaries. Chloroform increases the susceptibility of the tissues to histamine and therefore predisposes to shock.

3. *Post-anæsthetic toxæmia.*—This is much more common in children than in adults. The acetone bodies which produce this are the results of increased fat metabolism which in its turn is

a result of diminished carbohydrate metabolism. Starvation, constipation and anæsthesia cause increased fat metabolism and lead to acetonæmia. Elimination of these bodies is performed by the liver and kidneys. Deficient elimination results from damage to the liver and kidney cells. Septic absorption and chloroform damage these cells. Chloroform is especially contraindicated in children with abdominal sepsis and when they are known to suffer from cyclic vomiting.

4. *Chloroform syncope.*—80 per cent of deaths occur during the induction period. Such deaths are due entirely to the misuse of chloroform and should cease to take place, if our teaching is sound and honestly followed. There are two theories to account for these deaths. One of them explains it by stating that the patient suddenly takes a deep breath after a period of breath holding, and inhales concentrated chloroform vapour, which poisons the heart long before the other tissues of the body are saturated. The other theory is that there is ventricular fibrillation. Levy says that this can only occur during light anæsthesia. Safety is to be sought in deep anæsthesia.

Chloroform should not be used in alcoholics and difficult cases during the induction period, as is often done. To continue to administer chloroform to an excited and struggling patient cannot be made a safe proceeding.

Mills formulates the rule that except perhaps in cases of labour no one should induce full surgical anæsthesia supplied only with the means of administering chloroform. When chloroform is used it should be administered up to the second stage of anæsthesia and a change made to ether as soon as the first sign has appeared that the first stage has been reached. Chloroform must not be resumed till full anæsthesia has been reached. The change to ether must also be made before the stage of struggling has been reached.

In the Dundee Royal Infirmary when full induction with chloroform was the rule the death rate was 1.910 cases. From 1917 to 1923 when the method described above was largely followed the death rate was 1.74 cases.

W. B. HOWELL

Miscellaneous

A NEW ELEMENT

For the first time in its history the members of the American Chemical Society were informed at its recent meeting of the discovery of a new element. Professor Hopkins of the University of Illinois described his research which resulted in the discovery of a new element; the first to be discovered in the United States. It was found among those rare elements described by Crooks as the "lumber room" of the metals, and to it the name *Illinium* has been given in honour of the university where it was first identified and isolated.

The proof that a rare element was missing whose atomic number would place it between neodymium and samarium was in great part due to the application of Mosley's atomic number rule, which gave definite information as to the existence and location of gaps in the periodic table, and showed that the element No. 61 had still to be identified. The sharp break in the sequence of properties in the rare earth group between those two elements, could be explained only by placing the missing element between them. It was recognized that this missing element might be expected to share the striking similarity in properties of the other members of this rare earth group, and it seemed logical to institute a search for it in monazite sands, a mineral in which the first members of this family, the so-called cerium earths predominate. The material used in the investigation was the residue remaining after the extraction of thorium and part of the cerium for use in the manufacture of Welsbach mantles. The neodymium-rich material which was thought to contain sixty-one was converted to a bromate and fractionally recrystallized several times. As the process of solution and recrystallization proceeded two bands in the spectrum that had shown very faintly in supposedly pure neodymium, became stronger while the neodymium bands disappeared; and finally x-ray analysis confirmed the presence of a new element of No. 61 in the fractions resulting. The identification of illinium completes the list of rare earth elements. It must exist in ex-

tremely small amounts. Work has been instituted involving the extraction of a hundred pounds of the crude material with the purpose of obtaining enough of the element in the pure state to study its properties and its atomic weight. Only two more elements, according to Mosley's rule, remain to be discovered.—*Science*, May 21, and June 4, 1926.

ASSERTED STABILITY OF THE VITAMINES

Speaking before the annual meeting of the American Chemical Society Dr. E. F. Kohman of Washington read a paper in which he claimed that vitamins in vegetables were not injured to any extent by ordinary cooking. Vitamine C has very commonly been supposed to be injured in this way, and vitamine A which ensures normal growth was also supposed to be greatly damaged. The damage was supposed to result from the combination of the vitamine with oxygen in the air at the high temperatures of cooking. Mr. Kohman states that the only experimental evidence in the literature that vitamine A is destroyed by oxidation is in connection with fats when they are directly exposed to air in shallow layers while being heated. There is abundance of evidence that vitamine A is not destroyed by oxidation in the general handling of foods. Live steam has been passed through butter fat for six hours with no loss of vitamine A. Maize, chard, carrots, sweet potatoes, squash and alfalfa have been exposed for three hours to a temperature of 248 degrees Fahrenheit with no loss of vitamine A being evident. It is possible that vitamine A might be destroyed if oxygen were actually bubbled through them while they were heating, but in the conditions of ordinary cooking foods it may safely be stated that vitamine A is not oxydized. (*Science Supplement*, May 28, 1926).

LUMBAR PUNCTURE IN CASES OF POISONING

At a meeting of the Vienna Medical Society. Dr. F. Redlich discussed the methods used in

the third medical clinic for the treatment of severe poisoning, chiefly in cases of attempted suicide. Within the last two years this clinic has had over 160 cases, with 21 deaths. These included twenty-five attempts with barbitone which led to eleven deaths. Dr. Redlich treated thirteen cases of poisoning by this drug by lumbar puncture. The cases chosen were those which were severe, but not actually moribund. In twelve cases the cerebro-spinal fluid was tested for barbitone, and out of nine cases reported positive seven died. Luminal, corrosive sublimate, and lysol in cases of poisoning by these drugs were also detected in the cerebro-spinal fluid, so that Dr. Redlich feels justified in recommending repeated and extensive removal of the spinal fluid in cases of poisoning. It is a safe method of removing part of the poison from the body, and especially from that system most susceptible to its action.

THE INFLUENCE OF ADRENALIN ON THE LUMINESCENCE OF FIREFLIES

In a recent paper by C. W. and H. H. Green, the action of adrenalin on the luminous organs of a Californian shore fish was discussed. The authors found that an injection of adrenalin caused a brilliant glow of the luminous organs which persisted for several hours after the injection. An identical result is produced when adrenalin is injected into the body of a firefly, although it is true that scattered masses of tissue of a similar staining reaction to that of the medulla of the suprarenal gland are known to occur in intervertebrates. It is unlikely that the normal flashing of the firefly is controlled by hormones. The innervation of the luminous organs has been described by a number of observers who found nerve fibres penetrating the trachea end-cells. In general, adrenalin causes the contraction of smooth muscles, and if we

assume that adrenalin causes the contraction of the muscle fibres of the tracheal end-cells, and through this produces an enlargement of the lumen of the tracheole, the explanation of the prolonged glow is obvious since an abnormally large amount of air is admitted to the luminous tissue as long as the tracheals are dilated. The normal flash of the insect would appear to be due directly to nervous control, but it is also dependent indirectly upon breathing processes. By the contraction of the muscle fibres of the tracheal end-cells, and the consequent distension of the elastic ring at the instant when the air in the tracheal cell is under pressure a much greater amount of air is admitted to the tracheoles of the luminous organ thus causing a prolonged and increased luminescence. (*Science*, June 11, 1926).

A HYMN FOR CANADA

ALBERT DURRANT WATSON*
(1859-1926)

(*Tune, O Canada*)

Lord of the lands, beneath Thy bending skies,
On field and flood, where'er our banner flies,
Thy people lift their hearts to Thee,
Their grateful voices raise:
May our Dominion ever be
A temple to Thy praise,
Thy will alone let all enthroned;
Lord of the lands, make Canada Thine own.

Almighty Love, by Thy mysterious power,
In wisdom guide, with faith and freedom dower;
Be ours a nation evermore
That no oppression blights.
Where justice rules from shore to shore,
From Lakes to Northern Lights.
May Love alone for wrong atone;
Lord of the lands, make Canada Thine own.

Lord of the worlds, with strong eternal hand,
Hold us in honour, truth and self-command;
The loyal heart, the constant mind,
The courage to be true,
Our wide-extending empire bind,
And all the earth renew.
Thy name be known through every zone;
Lord of the worlds, make all the lands Thine own.

* Obituary of Dr. Watson is published in this issue.

Following the recent death of an interne at the Bicêtre Asylum from scarlet fever, French physicians are considering the provision of better protection and compensation for hospital doctors. So far free treatment in hospital has been

the only benefit accorded to those who suffer in the course of their duty, and medical men are not included in the compensation and indemnity regulations of 1898.

Obituaries

Dr. Alison Cumming died on June 4th at Vancouver. In his passing the medical profession of British Columbia has lost one of its most distinguished members. Known equally among his confrères and the public for his professional attainments and splendid character, his place in the ranks of the profession will not be easily filled. Born at Truro, Nova Scotia, September 25, 1877, he was the second of three sons of the Rev. Thos. Cumming, Presbyterian minister.

Dr. Cumming received his early education at Truro Academy and from it entered Dalhousie University, graduating with the degree of B.A. in 1899.

Halifax, in Cumming's student days, was the summer station for the Atlantic fleet and "Services" always had on their rugby football teams members who set a very high standard for the game as then played in the Maritimes. To Cumming, however, came the honour to captain his university team to championship over these crack players. His record in football and hockey and as leader of his team is one that all old Dalhousians greatly envy. His love of sport no doubt was a factor in deciding him after graduating to try his fortune on a tropical plantation in Trinidad. Here he contracted malaria and after a severe and protracted illness was compelled to give up the venture. His health was never so robust after this infection and he felt the effects of it for years.

On his return home in 1901, he entered as a student in the Faculty of Medicine, McGill University, in which he became prominent in sport and keenly interested in all student activities, and early passed his initiation as a member of the Alpha Delta Phi Greek Letter Society.



DR. ALISON CUMMING

From the time he entered McGill until his graduation in 1905 he pursued his studies earnestly and on completing his medical course he was elected to a position on the resident staff of the Royal Victoria

Hospital, entering that institution in June 1905. For a time he served under the late Dr. James Bell and acquired from that master surgeon those sound surgical principles which were to serve him so well when later he embarked in general practice. During the second year of his service he devoted considerable time to the study of surgical pathology under the direction of Dr. Edward Archibald now professor of surgery at McGill.

The west has always held a lure for an adventurous young man and to the Pacific coast he went in June 1907, and at once entered upon the duties as resident in the Vancouver General Hospital, and later on held in succession the position of assistant pathologist, 1908-1914; pathologist, 1914-1916; physician to the tubercular ward, 1916-1918; and senior physician on the staff 1918-1926. His connection with this institution was terminated only by his untimely illness and death.

The pathological department, under the able direction of Dr. B. D. Gillies with Dr. Cumming as his assistant, made its influence widely felt in the work of the hospital and resulted in a better study of the cases and a lessened number of indefinite diagnoses.

Following the election of Dr. Gillies to the senior staff of the hospital in 1914, Dr. Cumming was placed in charge of the department of pathology and remained in that position until August 1916 when he was appointed physician to the tubercular wards of the institution. During the next two years in addition to carrying on this work for the hospital, he performed most valuable service in the Military Hospital during the period when the care of the returned soldier was under the direction of the Military Hospitals Commission of Canada.

During the later years of the war, although engaged in general practice, Dr. Cumming devoted his attention chiefly to internal medicine. His opinion as a consultant was eagerly sought by his colleagues in difficult or puzzling cases and it was therefore no surprise to his medical friends when he announced in 1919 that in future his practice would be limited to medicine.

To better fit himself for doing special work he spent some months under Dr. Rowntree, at the University of Minnesota and on his return home he made an intensive study at the University of British Columbia of biochemistry and its application in modern medicine. He was among those selected by the Connaught Laboratories, to report on the treatment of diabetes with insulin, before it was deemed wise that that very potent remedy could with safety be released to the profession.

In the early months of 1925 the malady to which he finally succumbed, first made its presence felt and during the long year of increasing weakness and often accompanied with much pain, he bore his affliction with fortitude and fought a good fight to the end.

It is not given to every consultant, however well informed he may be, to possess that happy faculty of shedding light and knowledge on the subject in hand so that his confrères feel they are gainers thereby and the better for their contact with him. In this respect Dr. Cumming was a born teacher and always generous in drawing upon his storehouse of knowledge for the benefit of others.

As a physician he inspired confidence in his patients not only by his ready sympathy for them but even more so by the sound judgment and knowledge of his work displayed in the treatment of their ailments. Always fond of outdoor life he found recreation at golf at which game he was an adept. He was a member of Jericho and Shaughnessy Golf Clubs, the Vancouver

Polo Club and for many years of the Vancouver Club. Loved and respected by all who knew him and to his intimates who affectionately dubbed him "Deacon" his untimely passing has brought unfeigned sorrow and regret. To his devoted wife and little family we offer our sincere sympathy in their hour of trial. A.S.M.

Albert Durrant Watson, M.D., physician and litterateur, passed away suddenly at his home in Toronto, on May 3, 1926. He was of a good family; his maternal grandfather was an officer in Wellington's cavalry, and fought both in the Peninsular War, and at Waterloo. Born in Dixie, Ontario, in 1859, he received his general education in the Toronto Normal School, and after finishing his course in it taught in a school himself for a time before entering upon the study of medicine. He graduated from the medical school of Victoria University in 1883, but continued his studies during the following year in Edinburgh and there successfully passed the examination board of the Royal College of Physicians. He returned to Toronto where he commenced the practice of his profession, and although his work increased rapidly he found time for many other scientific pursuits. His fondness for astronomy led him into active work in the Royal Astronomical Society of which he became a councillor, and later on, president. His papers read before this society cover a wide field. Among them we may mention *Reformation and simplification of the calendar*; *Calendars: ancient and modern*; *Halley's Comet*, and *A sketch of the Life of Qibers*: a physician who divided with Jurine of Geneva Napoleon's prize for an essay on diphtheria, but was better known as the astronomer, who rediscovered the minor planets, Pallas and Vesta, as well as Uranus, and discovered several small comets.



DR. ALBERT DURRANT WATSON

In the literary development of Canada Dr. Watson played an important part. His essays and poems are perhaps better known in England and the United States than in Canada. He began his literary career relatively late in life; his first volume *The Sovereignty*

of *Ideals* appeared in 1903, twenty years after his graduation in medicine, and in it is found the secret of his approach to the problems of life. In *The poetical works of Albert Durrant Watson* a volume of 342 pages, which appeared in 1924, is given the following list of his other works: *The Sovereignty of Ideals*, 1903, 1906, 1919. *The Sovereignty of Character*, 1904, 1916. *The Wing of the Wildbird*, poems, 1908. *Love and the Universe, The Immortals and Other Poems*, 1913. *Heart of the Hills*, Poems, 1917. *Three Comrades of Jesus*, 1919. *The Dream of God*, Poem, 1922. *Our Canadian Literature, Representative Prose and Verse* (in collaboration with L. A. Pierce) 1922, 1923, 1924. *Robert Norwood* (in the *Makers of Canadian Literature Series*) 1923. *Woman. A Poem of the New Age*, 1923. *Mediums and Mystics. A study in Spiritual Laws and Psychic Forces*, (in collaboration with Margaret Lawrence), 1923. His poetical works ought to establish him securely among the great names in our native literature.

His "Hymn for Canada" published in 1915 for the melody "O Canada" is generally acknowledged to be the best poem on the subject in English. This with five selections from his sacred poems are included in the Methodist and the Presbyterian Hymnals. Agnes Laut has said "he sang because he had to sing, and had a great message to deliver; with Watson there entered into Canadian literature something ranking with the sublimity of an Emerson or a Whitman." Lorne Pierce wrote "he was primarily concerned with man's eternal quest for the utmost horizons of truth, and each of his poems really are anonymous *apologia* for his own pioneering spirit. No writer of Canadian literature has been so little preoccupied with things of sense, and matters of local and temporary interest. His mysticism evolved through suffering and disillusionment developed into an emotion wholesome and beautiful. A great deal of our Canadian poetry has to do with the greatness and the glory of our national inheritance. Watson achieved some rare heights in descriptive ecstasy, as many poems under *Maple and Snow, Mountains of the Dawn and Moon Drift* in the recent edition of his works will clearly show." He appears at his best in such poems as *Woman, Love and the Universe and To Worlds More Wide*, in which he deals with matters of the spirit, and endeavours to show how far one may live in such a frame of mind and how far it will take one. He made costly errors; his greatest errors were in trusting too implicitly the spiritual experiences of others; but he went on quietly, proving so far as possible all things, and holding fast to that which he believed good.

He for a time took a deep interest in spiritualism, having been president of the Association for Psychical Research of Canada. Early in 1919 in a magazine *The Twentieth Plane* which for a short time he edited, he reported what occurred through a medium, at a series of seances during 1918 at his home and that of Prof. Abbott, presenting these as scientific observations which might be recorded. From this magazine he withdrew in 1921 after some three numbers had appeared, and referred afterwards to his psychic experiences of the previous three years as "an episode now closed." Yet he never lost interest in psychic phenomena, and the volume *Mediums and Mystics* contains this prose: "He who believes the all-loving Father has many ways of speaking comfort to our human hearts, (one of which may be through a revelation from the unseen) has the good company of practically all the writers of the New Testament, a volume which begins and ends with mystical announcements. On the other hand, he who seeks communication from discarnate souls receives doubtful information, is in questionable company, and runs serious risks. . . . After years of investigation of psychic values, when millions of human hearts were crying out of an agony of doubt and sorrow for solace and assurance, we were led to conclude that within each of us is a ladder on which we may climb to the Heart

of Love, but our faith must be built into our own life and deed, into our own prayer and aspiration; otherwise the storms of time will shatter it."

Dr. Watson is survived by his widow, three daughters and two sons, one of the latter Dr. W. V. Watson, is a well known physician in Toronto.

J. H. ELLIOTT

Sir William Leishman, M.B., F.R.C.P., F.R.S., Director General of the Army Medical Service, died at the age of sixty years. Science and medicine have suffered a heavy loss by the deaths during the last month of Sir William Leishman and Sir Frederick Mott. Both were pioneers in the truest sense of the word, and in both a lively imagination was disciplined by unswerving fidelity to the truth. To both it was given to render signal service to their generation and posterity. The son of Dr. William Leishman, professor of Midwifery in the University of Glasgow, he was educated in that seat of learning and in 1886 graduated from the Faculty of Medicine. He entered the Army Medical Service the following year. He served in the Waziristan expedition and while on it devoted himself to the subject of bacteriology especially that portion of it connected with tropical medicine. At the close of the war, he was appointed assistant professor of pathology at the Army Medical School at Netley, and after three years was promoted to the post of professor of pathology in the Royal Army Medical College at Millbank, London. He was elected a fellow of the Royal Society in 1910, and in 1912 was appointed honorary physician to the King. For ten years he was a member of the Medical Research Council. Only a few weeks ago he was elected president of the section of Comparative Medicine at the Royal Society of London. Early attempts to produce a vaccination against typhoid fever were not at first successful, and experiences in the South African War led critics to declare that the cure was worse than the disease. Sir William, however, was not discouraged but in association with Sir Almroth Wright pursued studiously the investigation with the result that when the Great War came typhoid fever, that frightful menace of armies, was practically eliminated. Leishman's greatest contribution to medicine, however, was his work on the group of diseases which now bear his name—Leishmaniasis. It was in 1900 that he discovered a body in the blood of a soldier affected with Indian Kala-azar which is now known as the Leishman Donovan body, and has been proved to be the cause of kala-azar and of the Oriental boil.

Sir Frederick Mott, honorary director of research on mental diseases, University of Birmingham, died in the General Hospital in Birmingham on the 26th of May. He was stricken while travelling to Birmingham and on arrival of the train was conveyed to the hospital where he was found to be suffering from widespread cerebral thrombosis from which he never rallied. His distinguished career and his scientific attainments give him a unique place in the medical world. His wide range of interests, his humanity and enthusiasm, and his genial personality make his loss deeply felt by all who had the privilege of coming into personal contact with him. In his own specialty of nervous and mental disease he was both clinician and research worker, equally at home by the bedside and in the laboratory, and in both departments displaying his sound sense and keen judgment. His researches were mainly concerned with morbid anatomy, but he fostered biochemical and physiological inquiry in his laboratory, believing that the next step towards a better understanding of mental disease was likely to be taken in that direction. It was largely owing to his energy and force of character that the scheme of his friend Dr. Maudsley for the establishment of a hospital for the treatment

of early cases of mental and functional nervous disease came to fruition. The Maudsley Hospital owes him a debt at least as great as to the physician whose name it bears.

Dr. Albert Prevost, chief medical officer of the sanatorium at Cartierville and well-known Montreal physician, was fatally injured July 4th in an automobile accident on the road near St. Paul L'Ermite, Que. Dr. D. A. Benoit, of Montreal, driving with him was also severely injured. The medical men were on their way back to Montreal after having visited a patient in Lanoraie. The accident occurred when the automobile driven by Dr. Prevost crashed into an automobile which was being hauled out of a ditch alongside the road. Both were brought as promptly as possible to the Royal Victoria Hospital by an ambulance but Dr. Prevost died on the road; he had suffered a triple fracture of the skull. Dr. Prevost was well known in Montreal. He was born here forty-five years ago and was educated in St. Mary's College. He studied medicine at Laval University, Montreal, and after graduation went to Paris where he practised for ten years. He returned to Montreal in 1914. Four years ago he opened the Prevost Sanatorium at Cartierville. He was a member of the Medico-Legal Faculty of Paris, professor at the University of Montreal and professor in the clinic of nervous diseases at the Notre Dame Hospital, of which he was also one of the attending physicians.

Dr. Alexander D. Stewart, well-known physician in Montreal died suddenly, while making a professional visit to the Royal Victoria Hospital. Death was due to a sudden cardiac failure. He had apparently been in good health. After attending an obstetrical case Dr. Stewart took advantage of his first visit to the new Maternity Hospital, now a branch of the Royal Victoria Hospital, to inspect the buildings. He collapsed in a corridor, and although Dr. Fletcher and members of the house staff rushed to him it could be seen that he was already beyond human aid. Dr. Stewart was born in Oro, Ontario, in 1863, the son of the late Rev. James Stewart, and received his early education in the public schools of Toronto. Coming to McGill University for his higher studies, he graduated in medicine in 1888 and in the following year became house surgeon of the Royal Victoria Hospital. On his return he settled at Richmond, Que., where he practised his profession for some years. He came to Montreal in 1898, and established a practice, which in time became extensive and exacting. He never spared himself and always gave of his best. During his student days he enlisted as a member of the Medical Corps which was attached to the expedition dispatched to the North West to quell the Riel Rebellion.

Dr. David Adam Bowlby, the senior of the active medical practitioners in Simcoe, Ontario, died on June 11th after a prolonged and debilitating illness. Notwithstanding this illness which extended into many months, he continued his practice until comparatively recently. He remained mentally bright until he sank into unconsciousness two days before his death.

Dr. Bowlby was born in 1855 on the Bowlby farm near Simcoe, an extensive property which had been handed down from his paternal grandfather who was a United Empire Loyalist. He obtained the degree of Doctor in Medicine from the University of Toronto, in 1879, and acted as one of the house surgeons in the Toronto General Hospital during the following year. Dr. Bowlby on both his father's and his mother's side was descended from parents who had been pioneers in his district in Ontario. His mother was the daughter of Dr. David Duncombe of Waterford, one of the pioneer medical practitioners in the Province of Ontario. Dr.

Bowlby was greatly respected as a general practitioner. His work was characterized by a clear judgment and a devotion to the highest principles of our profession.

W. A. MCINTOSH

Dr. J. A. Chopin, noted chemist and bacteriologist, who years ago when conducting his researches made an early demonstration of the paratyphoid bacillus, died in Montreal. He was the son of the late Dr. J. N. Chopin, of Sault au Recollet. After concluding his studies at St. Mary's College, he studied medicine at the University of Victoria of Cobourg, Montreal, where he passed his examinations for admission to the practice of medicine in 1880, winning the Hingston Prize for surgery. For ten years he was chief chemist of the provincial Department of Health. After studying bac-

teriology and chemistry in the laboratories of Jules Augier and Mickel at Paris, he returned to Montreal in 1903, where he worked under Dr. Adami at McGill University, conducting the regular analysis of the city water.

GEORGE HALL

Dr. John Howland, Professor of Pædiatrics in the Johns Hopkins Medical School, and Pædiatrician in Chief of the Johns Hopkins Hospital, died in London on June 20th after an internal operation performed following a collapse. Dr. Howland was fifty-three years old.

Dr. James N. Richards of Warkworth one of the best known physicians of the district about Campbellford, died suddenly on June 11th. Dr. Richards was a graduate of Toronto in 1909.

News Items

ACKNOWLEDGEMENTS

We have received abstracts Nos. 36 and 37 of Current Public Health Literature issued by the Department of Health, Ottawa. These are excellent examples of how much interesting material can be gathered in a review of even a small amount of the monthly periodical literature. Some book reviews are also included.

The *Journal* desires to report the receipt from the Health Department of the report of the city of Edmonton for 1925. It must congratulate the medical officer of health upon the low death rate, both among adults and infants. The population of Edmonton is estimated at 65,000. The death rate per thousand of the population was only seven. The infantile mortality per thousand births was only 54.8. The report shows also a remarkably low death rate from the infectious fevers, as also for cancer, tuberculosis and influenza. At the isolation hospital 457 patients were admitted during the year; the number of deaths was only thirteen including the three cases of cerebro-spinal meningitis all of which died. The report states that

the scavenging and garbage collecting had been carried out in a satisfactory manner, and bacteriological reports indicate that the public water supply is kept continuously free from any dangerous contamination. No death occurred from typhoid fever during the twelve months.

The *Health Bulletin* issued by the Department of Public Health, Toronto, for July contains some timely notes on the potential dangers that confront us in hot weather. Some sound advice is also contained regarding the feeding of infants in hot weather.

We desire to acknowledge the receipt of an interesting brochure on the "Eye clinics of India," written by Dr. Derrick T. Vail, Sr., M.D., Cincinnati, Ohio. His visit was made for the purpose of seeing for himself Dr. Holland's famous eye clinic at Shikarpur. He gives a very excellent description of the great amount of work accomplished in a very quiet way.

GREAT BRITAIN

A POST-GRADUATE HOSTEL IN LONDON

There has long been a feeling that medical men who come to London for post-graduate study have no opportunity of meeting their teachers and fellow students socially. This was one of the original aims of the Fellowship of Medicine, established by Sir StClair Thomson and the late Sir John MacAlister as an organization independent of the Post-Graduate Association. For various reasons, including financial considerations, the Fellowship did not make all the progress that was desired, and after a short experience strengthened its position by amalgamating with the Post-Graduate Association. Many of those who have given attention to the organization of post-graduate medical education in London believe that there is need for a special hostel in London at which graduates taking the courses now arranged by the

combined Fellowship of Medicine and Post-Graduate Association could reside. It will be remembered that rather less than a year ago the Minister of Health appointed a committee "to draw up a practical scheme of post-graduate medical education centred in London," and, although we have no direct information, it is probable that one of the subjects which will be discussed by that committee will be the establishment of such a hostel. Meanwhile, in order to test the extent of the need, arrangements have been made to provide a central place of residence for post-graduate students where they will be received at rates varying with the requirements of the visitor. The hostel will be under the supervision of a president, a director, and a treasurer, who will form the committee, working in conjunction with a board of vice-presidents drawn from the metropolitan and provincial schools and three or more members chosen by the post-graduate members

themselves. The suggestion was brought before the Council of the British Medical Association at its last meeting, and the Medical Secretary was appointed to take part in the preliminary arrangements and to assist in giving the scheme a start. The managers of the Imperial Hotel in Russell Square have agreed to place at the disposal of the committee a bedroom with writing table for each member; a reading room which will be available all day and every day; a dining room where breakfast and dinner can be taken apart from the general guests of the hotel; and a lecture room which is to be at the service of the hostel from 9 p.m. every day. It is hoped that the members of the committee will take frequent opportunities of dining at the hostel, and that after dinner informal discussions may take place on subjects of medical interest. A preliminary meeting was held recently when Sir D'Arcy Power, K.B.E., F.R.C.S., took the chair and explained the objects of the hostel as set forth above. He expressed the hope that it would be found possible to work with and by the Fellowship of Medicine, which was doing such excellent work in post-graduate teaching. He attributed the inception and carrying out of the scheme to Mr. A. P. Bertwistle, F.R.C.S., Ed., formerly of Leeds and now of London, and read a number of letters of approval from London, and read a number of letters of approval from may be obtained from Mr. Bertwistle, 4, Spital Square, Bishopsgate, E.1. (*Brit. Med. Jour.*, July 10, 1926).

ORTHOPÆDIC CENTRES FOR WALES

Sir Robert Jones, whose energy and enthusiasm led to so much being done for the soldier crippled in war, has not ceased to direct attention to the needs of crippled children. On July 1st he delivered an address at a meeting arranged in London (at Carnegie House) by Sir John Lynn-Thomas, who will act as honorary secretary of the Welsh Branch of the Central Committee for the Care of Cripples then inaugurated. Lord Kenyon presided, and many medical officers of health and others from Wales were present. A message was read from the Prince of Wales in the course of which he expressed a hope that an alliance might be made with the hospital in Cardiff which bears his name (the Prince of Wales's Hospital for Limbless and Crippled Soldiers). Sir Robert Jones said that crippled children were in exactly the same position as the soldier who had suffered damage to his limbs in warfare. The child must be seen early, and it must have rest at the onset of the disease. To meet these requirements there must be plenty of hospital beds so that there might be no waiting list, rapid evacuation must be avoided, and there must be provision for after-care in order to secure continuity of treatment. To achieve this ideal treatment three things were essential—open-air hospitals, skilled staffs (medical and nursing), and after-care clinics. The hospital must be in the country; the staffs must be specially trained; the hospital must be thoroughly equipped for physiotherapy, and with ultra-violet rays, and so on. The after-care clinics should be within twenty miles of

the hospital. Such schemes were already in existence in Oxfordshire and Shropshire; Wales was a difficult problem, but it was well to remember that it had a well organized tuberculosis scheme. Although the charter of the Welsh Memorial Association did not allow non-tuberculous cripples to be brought under the same control as the tuberculous, Sir Robert Jones hoped that both sides would come together for the purpose of distributing crippled patients to appropriate hospitals, and that they might arrange to divide certain expenses between them. (*Brit. Med. Jour.*, July 10, 1926).

The *Medical Journal of Australia* (May 22, 1926) is urgent in its appeal to the Australian medical profession for serious consideration of the proposals of the Royal Commission on Health.

In an editorial comment on the situation it is pointed out that "It is essential that the events of 1911 in connexion with the national health insurance scheme in Great Britain should not be repeated in Australia. In England the medical profession took no interest in the problem of national health insurance until the bill was before Parliament. It was then too late to influence the legislature to modify the proposals, so that the support of the medical profession as a body could have been assured. Much of the opposition to the *National Health Insurance Bill* of 1911 was due to a lack of understanding of the proposals and a failure to grasp the objectives of those responsible for the measure. Had the medical profession been induced to anticipate the introduction of the panel system and to have examined the matter with care and understanding, the unseemly scenes at certain great medical gatherings could have been avoided.

While the whole report is important and urgent, it appears to us that two or three chapters demand immediate consideration. These are the model scheme for the co-operation of the Commonwealth with the States in the measures aiming at the prevention of disease, the institution of an efficient school of hygiene, preventive medicine and tropical medicine at the Sydney University and the transfer of the powers regarding medical registration from the States to the Commonwealth. The model scheme includes the enlistment of the whole medical profession in the campaign. To a large extent the suggestions embodied in the Hone-Newland report have been accepted by the Commissioners. The general practitioner is thus faced with an entirely new prospect. He will be expected to devote a proportion of his time and energies to preventive medicine; it will become his duty to assist the health authorities to trace the sources of infection and to render them harmless. He will have responsibilities to the state as well as to his patients. He will have to make up his mind whether his services to the state will be based on a bargain, a contract whose clauses are to be translated literally or whether he will be prepared to lend his aid freely for the benefit of the community and pit a reasonable remuneration on the credit side of his sheet against services rendered generally to the state and privileges received from the law and the community in virtue of his position as a registered medical practitioner. A thorough investigation of the report, a further study of the Hone-Newland report and the exercise of a little imagination will give him the key to the situation. He will be able to anticipate the proposals that will form the policy of the Commonwealth health authority and on the basis of what he anticipates, he will be able to decide what he will do. If this is not undertaken quickly, we shall have the proposals thrust forward before the medical profession has made up its mind. It would be a disaster."

Photographs in Court Prohibited.—The *Lancet*, May 29, notes that after June 1 physicians in England will be protected from a form of publicity which they

sometimes encounter, but seldom enjoy in that country. On that day, a law becomes effective, which makes it an offense to photograph, in any court, any person who is a judge, a juror, a witness or one of the parties in the case. Any other kind of portraiture or sketching attempted in court with a view to publication is also pro-

hibited, and photographing is deemed to occur in court if it takes place anywhere within the court buildings, or while the victim is entering or leaving the court room, or the precinct of the building. Violation of the new law is punishable, summarily, by a fine not to exceed £50.

GENERAL

Sir James Cantlie, the well-known London surgeon and specialist in tropical medicine, died on May 29th at the age of seventy-five.

The 24th Rush Society lecture was given at the College of Physicians, Philadelphia, by Dr. W. E. Dixon, of Cambridge, England, on "The chemistry and significance of the pituitary gland."

John D. Rockefeller, Junior, has given to the University of Strassburg the sum of three and a half million francs for the enlargement of the nose and ear clinic, and for the completion of various unfinished researches.

Dr. J. Stuart Foster, who has been an assistant professor of physics at McGill University since 1924, has been awarded a Fellowship by the International Education Board, and will go to Copenhagen to pursue researches on the Stark effect in association with Professor Niels Bohr.

The Presbyterian Hospital of New York City, affiliated with Columbia University, has received a bequest of the greater part of the residuary estate of Louis Sherry, restaurateur, said to amount to \$1,000,000.00. The fund is to be known as the Bertha Sherry Memorial Fund, and is to be used for the benefit of cancer patients.

A proposal for a memorial to Alexander Graham Bell, inventor of the telephone while a professor at Boston University was presented to a group of fifty prominent Bostonians at a recent dinner. General John J. Carty, vice-president of the American Telephone and Telegraph Company, was the principal speaker. About \$50,000.00 was pledged over the dinner table.

A memorial was unveiled at Lebanon, Connecticut, on June 29th, to Dr. William Beaumont, the pioneer American physiologist and a distinguished member of the U. S. Army Medical Corps who carried out investigations on gastric digestion through an accidental fistula in Alexis St. Martin. Dr. Beaumont was born in Lebanon, November 21, 1789.

The *London Times* reports that Professor Hugh Cabot, professor of surgery in the University of Michigan, is visiting London and will take charge for a fortnight of the teaching of surgery at St. Bartholomew's Hospital and Medical College. At a meeting of the council of the hospital, Dr. Cabot was admitted as an honorary perpetual student of the medical college, an honour conferred only once before when Professor Harvey Cushman had charge of the teaching of surgery in 1922.

Gifts and legacies for the past year reported at the recent commencement of Harvard University amounted to nearly seven million dollars. This amount does not include receipts of money arising from the \$10,000,000.00 campaign, nor the payment of subscriptions to the Harvard Endowment Fund and certain other income from

legacies. The largest single legacy received was \$2,242,616.00 from the estate of Artemus Ward. There was also a bequest of \$700,000.00 from the estate of Joseph De La Marr for the Medical School.

A group of collectors from the Field Museum, Chicago, sailed from New York on June 19th on an exploration expedition to Brazil. They will proceed inland in search of specimens of mineral, animal and plant life. The expedition plans to reach Rio on July 1st, and go directly to the Organ Mountains. The subsequent route includes a visit to Sao Paulo and to the unknown portion of the Parana River. Among the members of the expedition are several who accompanied Theodore Roosevelt on his trip along the River of Doubt.

We desire to acknowledge the receipt of a new periodical *The Quarterly Review of Biology*. In the foreword its editor Professor Raymond Pearl says, "Popular scientific writing which takes as its target the mental age of about ten, is quite as nauseating to intelligent lay readers as it is to men of science." There is, however, a fairly numerous body of cultivated men and women genuinely interested in knowing facts regarding progressive biology, and who are capable of understanding clearly written essays in this field.

This journal is offered to readers in all the sciences interested in correlating the accomplishment of research in one field with those of advancement in others. It may be difficult at times to see wherein certain researches in biology contain practical value, but periodicals such as the present one serve to give wide views, based on authoritative work. We extend our best wishes for the success of this new venture.

A SNAKE-BITE SERUM LABORATORY

Dr. Amaral of Sao Paulo, Brazil, is in America on leave of absence from the Brazilian Government's Serum Therapeutic Institute, at Sao Paulo, Brazil, of which he is chief. He was invited to come to the United States to study the problem of the increasing number of fatalities from snake bites. Some fifty deaths from snake bites last year, in this country alone, have served to focus the attention of health authorities on this growing menace. The importance which attaches to this new project is everywhere recognized. Snake bite poisoning has become a matter of considerable economic importance in certain sections of Central and North America, where many agricultural, engineering and construction workers have been bitten. Dr. Amaral's first work will be to collect a supply of venom with which to begin the treatment of horses, and also to arrange for the collection of the principal species of poisonous snakes through the south and south-western United States, also in Mexico, which will serve as the source of further supplies of the poison. Before the end of the summer, sufficient collections of venomous snakes will have been made, and equipment installed, so that the immunization of horses can be started. It is anticipated that a polyvalent antivenin will first be produced. Later, specific antivenins will be produced for use in certain countries.

NOVA SCOTIA

The Rotarians and Gyros of New Glasgow have joined forces to "put across" a drive to relieve the Aberdeen Hospital of its indebtedness.

Dr. C. B. Cameron has removed from Petite Rivière to Bridgewater. Dr. S. P. Young has purchased Dr. Cameron's property at Petite Rivière and has located there.

Dr. A. F. Weir, who has been practising at Freeport for several years, is about to leave for England and the continent for a prolonged period of graduate study. Dr. J. A. Milne, who has recently returned from England, has taken over Dr. Weir's practice.

Grace Maternity Hospital, Halifax, had a "birth-day party" in June which was attended by a large number of very young folk whose introduction to mundane affairs was obtained at the hospital, and who, with their mothers, returned to the hospital to celebrate that circumstance. The function proved most enjoyable and successful in every respect.

The medical faculty of Dalhousie University has decided that the medical course shall hereafter be known as one of five years, based upon two college years of arts and science. Heretofore the course has been one of six years, based upon one college year, but the first year was really one of arts and science designed to meet the special needs of prospective medical students. What was formerly the first year of the medical course becomes the second pre-medical year.

The Canadian Dental Association is to hold its thirteenth biennial convention at Halifax from the sixteenth to the nineteenth of August. An interesting scientific programme has been arranged, and the matter of entertainment has been carefully provided for. Golfers will be welcomed by the three golf clubs, and a harbour excursion followed by tea and an informal dance at the Royal Nova Scotia Yacht Squadron's house, a hodge-podge at the Studley Quoit Club, and an evening at the Public Gardens are provided.

A very pleasant ceremony was carried out at the Aberdeen Hospital, New Glasgow, on the seventh of July, when a tablet erected in honour of the Rev. Dr. James Carruthers was unveiled. Dr. Carruthers, although now residing in British Columbia, was for many years stationed at New Glasgow, and it was to his efforts particularly that the establishment of the Aberdeen Hospital was due. A gratifying feature of the ceremony was Dr. Carruthers' presence as guest of honour. He gave an address in which he reviewed the early difficulties and modest beginnings, and complimented the good people of New Glasgow and vicinity on the splendid manner in which they have supported the hospital and the really fine institution they now possess. In the evening, a class of nine nurses was graduated. Dr. Carruthers took part in the exercises, sketching in eloquent terms the progress

which has been made by the nursing profession in the last quarter of a century and paying tribute to the nobility of the nurse's work.

The Association of Medical Health Officers of Nova Scotia met at Halifax on the seventh of July, under the presidency of Dr. E. D. MacLean, of Truro. The greater part of the time was given over to a discussion of the scheme for more actively combating tuberculosis. The plan was fully outlined by Dr. Jost, provincial health officer, and was cordially endorsed by the association. Dr. R. E. Wodehouse, secretary of the Canadian Tuberculosis Association, was present and spoke on the progress being made in antituberculosis work throughout the Dominion. Dr. H. A. Chisholm, of the provincial health department, discussed the relative merits of the Wassermann and Kahn tests for syphilis, and intimated that the Kahn test might soon be substituted for the Wassermann test at the public health laboratory. A resolution was passed requesting the provincial government to require complete observance of the sections of the public health act relative to the employment of public health nurses. The officers for the ensuing year are as follows: President, Dr. R. L. Blackadar, Port Maitland; vice-presidents, Dr. A. S. Kendall, Sydney and Dr. B. S. Bishop, Kentville; secretary-treasurer, Dr. A. C. Jost, Halifax; executive committee, the officers and Drs. F. E. Rice, Sandy Cove, W. F. MacKinnon, Antigonish, Alister Calder, Glace Bay.

The scheme of the Nova Scotia Tuberculosis Commission, which is to carry on its work in close alliance with the provincial department of health—Dr. Jost being the executive officer of the commission—includes the appointment of an additional tuberculosis examiner, travelling nurses to accompany the examiners, extension of tuberculosis clinics to smaller communities, provision of more facilities for hospital care, addition to laboratory facilities, and encouragement of measures aimed at the elimination of tuberculosis in cattle. The commission will endeavour to obtain a census of all tuberculous persons in the province. A number of leaflets descriptive of the aims of the commission have been issued, the radio has been used for publicity purposes, and an appeal has been made for financial support. Public meetings are to be held at various places, the first of which, at Pictou, July thirteenth, will be addressed by Dr. R. E. Wodehouse, secretary of the Canadian Tuberculosis Association, Mr. G. J. Drolet, consulting statistician of the Milbank Fund, and Dr. A. F. Miller, medical superintendent of the Nova Scotia Sanatorium. Mrs. A. I. Mader, who has for several years been very actively associated with the Halifax County Antituberculosis League, has been appointed secretary to the commission. It is planned to extend the work over a period of three years. The Canadian Tuberculosis Association is contributing \$5,000.00 a year, and the government of Nova Scotia \$10,000.00 a year, while it is expected that private subscriptions will amount to at least \$25,000.00 a year.

NEW BRUNSWICK

On June 17th the Moncton Hospital elections resulted in the appointment of the following staff: senior surgeons, Drs. W. A. Ferguson, A. R. Myers and W. P. Kirby; junior surgeons, Drs. Lyons, Brittain, McNaughton and Atkinson. Senior physicians, Drs.

R. G. Girvin, A. E. Forbes and J. E. Leger; junior physicians, Drs. C. R. Baxter, J. A. Gaudet and H. A. Jones. Ear, eyes, nose and throat department, Drs. S. W. Burgess, Gooderich and J. A. Gaudet. Paediatrician, Dr. G. O. Taylor. Roentgenologist, Dr.

F. A. Richard. Anæsthetists, Drs. Coleman and Baxter. Dental surgeons, Dr. F. A. Taylor and Y. Gaudet. Consulting staff, Drs. L. H. Price, Coleman, H. L. Logan, Alphonse Sormany. The question of internes for the hospital was discussed and a recommendation has been forwarded to the superintendent.

Dr. W. E. Rowley has returned to practice and beyond a slight limp, is almost completely recovered from his injury which occurred last winter.

At the regular monthly meeting of the Board of Commissioners of the General Public Hospital, Dr. A. E. Macaulay was appointed as a senior surgeon of the General Public Hospital to succeed the late Dr. John H. Allingham. Dr. Macaulay's place on the Junior Board was filled by the appointment of Dr. F. T. Dunlop.

For some time there has been an agitation, especially in Saint John County to provide for the legal distribution of unpasteurized milk. This has at last been provided for. On June 23rd the Royal Gazette published a notice, the opening section of which is as follows: "Notwithstanding any regulations of any sub-district board of health, it shall be lawful to sell, hold for sale and offer for sale for human consumption in the province of New Brunswick milk and cream to be known as raw milk or raw cream—grade A."

The notice sets forth the regulations under which the milk or cream may be sold. The regulations provide for tuberculin test of cattle, plain marking "raw milk—grade A," with name of producing dairyman, together with many other safeguards. This is an unfortunate acknowledgement of pressure on the government by interested parties, as pasteurization of milk has been for some time, quite successful in Saint John and is agreeable to the greater body of citizens.

The meeting of the New Brunswick Medical Society was held this year in Moncton. The meetings were convened in the Moncton City Hall, kindly loaned by the corporation of Moncton. The attendance was the largest recorded in the history of the New Brunswick Association, ninety-four members being registered. They were accompanied by an unusually large ladies' delegation.

The hospitality of the Moncton doctors left nothing to be desired; the visiting physicians being entertained by a banquet on July 14th, and a shore dinner. The ladies were entertained at a bridge tea at the golf club on the 14th and at a tea in Shediac at the home of Mrs. Sormany, the wife of the president.

The election of officers resulted as follows: President, Dr. L. M. Curren, Saint John. Vice-President (First) Dr. J. B. McKenzie of Loggieville. Second Vice-President, Dr. C. J. Veniot of Bathurst. Secretary, Dr. J. R. Nugent of Saint John. Executive Committee, Dr. W. Earle, Perth; Dr. L. G. Pinault, Campbellton; Dr. F. W. Lunney, Saint John; Dr. D. W. Ross, Fredericton; Dr. W. P. Kirby, Moncton; Dr. Alphonse Sormany, Shediac.

Members of the Council of Physicians and Surgeons were elected as follows: Dr. J. M. Barry, Saint John; Dr. P. H. Laporte, Edmundston; Dr. G. A. B. Addy, Saint John; Dr. W. D. Rankin, Woodstock; Dr. L. R. Price, Moncton.

Business transacted included, first, the appointment of a committee composed of Doctors G. Clowes Van Wart, R. W. L. Earle, W. P. Kirby, J. J. McKenzie and William Warwick, to canvas the members in their district for contributions to the Lister Memorial Fund.

Second: The appointment of A. Stanley Kirkland, M.D., and L. G. Pinault, M.D., as a committee to be

known as the Canadian Medical Association membership committee. This committee to function at the meeting and throughout the year in an effort to increase the membership in the Canadian Medical Association.

Third: On motion of Dr. A. R. Myers, seconded by Dr. N. A. Oulton, it was resolved to request the local legislature through the council of the College of Physicians and Surgeons of New Brunswick "That the law in New Brunswick concerning the conduct of cases of suit for malpractice be so changed that the defendant may have the choice of trial by judge instead of jury."

Fourth: A motion by Dr. H. A. Farris and Dr. S. H. McDonald of Saint John was adopted "that the Council of Physicians and Surgeons of New Brunswick request the legislature to empower the council to increase the amount of money collectible under the Medical Act as registration fees to \$10.00 a year; and that following the accomplishment of this legislature, the yearly registration fee be \$7.00; \$5.00 of which shall be remitted to the New Brunswick Medical Society as a yearly fee."

Fifth: The following committee was appointed to act permanently in dealing with complaints and any other action necessary arising out of the administration of the Workmen's Compensation Act, either directly with the Compensation Board or with the New Brunswick legislature: Dr. L. M. Curren, Dr. S. H. McDonald, Saint John; Drs. L. G. Pinault, J. B. McKenzie, North Shore; Drs. R. W. Early, C. F. Woolverton, Carleton and Victoria; Drs. D. W. Ross, H. W. Dougan, Fredericton; Drs. M. A. Oulton and A. E. Forbes, Westmorland.

Sixth: Dr. Wm. Warwick was appointed as the New Brunswick representative on the Board of Governors of the Victorian Order of Nurses of Canada.

Seventh: The following were nominated as representatives on the council of the Canadian Medical Association; Dr. L. M. Curren, President of the New Brunswick Medical Association; Dr. J. R. Nugent, Dr. A. R. Myers, Dr. W. D. Rankin, Dr. G. C. Van Wart, Dr. L. G. Pinault.

Eighth: As requested by the Canadian Medical Association, the following were nominated to the various committees: Legislature, Dr. W. F. Roberts, Saint John; Dr. C. H. Laporte, Edmundston; Medical Education, Dr. L. DeV. Chipman, Saint John and Dr. W. A. Ferguson, Moncton. Constitution and By-laws, Dr. W. D. Rankin, Woodstock, Dr. Alphonse Sormany, Shediac. Intra-Canadian Relations, Dr. G. Clowes Van Wart, Fredericton; Dr. G. A. B. Addy of Saint John. Ethics and Credentials, Dr. J. B. McKenzie, Loggieville; Dr. G. H. Wetmore, Hampton. Public Health, Dr. H. A. Farris, Saint John, Dr. H. I. Taylor of St. George. Economics, Dr. R. L. Ellis, Jacquet River and Dr. V. D. Davidson, Saint John. Pharmacy, Dr. G. G. Melvin, Fredericton, Dr. B. A. Marvin, Chatham.

Ninth: Dr. G. Clowes Van Wart spoke appreciatively of the work of the Canadian Medical Protective Association and advised that all members of the New Brunswick Medical Society, seriously consider membership in this society. The presidential address read by Dr. Sormany of Shediac, dealt with the charlatan in medicine and discussed possible remedies, with special emphasis on the part that might be played by the medical school.

On invitation from members of the Miramichi district, it was decided to hold the annual meeting in 1927 at Chatham. The programme proved to be varied, interesting and instructive. The contributors from outside the province brought messages of fellowship and good-will from the Universities of Toronto, McGill and Dalhousie.

The paper of Dr. I. M. Rabinovitch was especially welcome and it had been looked forward to for a long time. His classification of diabetics, especially with

regard to their need of hospitalization was most useful. We hope he may return soon as an extra-mural lecturer.

Dr. John Oille and Dr. R. L. Tisdall came as strangers to most of us, but now have many friends in New Brunswick. We hope to see Dr. Oille's paper on "Pain in the chest" appear in the *Canadian Medical Journal*. Dr. John Fraser of Montreal and Dr. G. H. Murphy of Halifax have been well known in New Brunswick for years; their message this year enhanced their already enviable reputation. There is one criticism in evidence in looking back on this year's meeting, that is, we tried to do too much. This mistake should not again be made. There were too many papers and not sufficient time for discussion. I trust our visitors will not suspect us of discourtesy in cutting short the discussion. We regret it more

than they possibly could. Discussion, if frank, is the spice of any programme, as was evidenced in the case of a paper on blood transfusion. This little scrimmage became so general that our visitors became involved to everyone's delight and benefit. A feature of interest about this session was the interest in the affairs of the Canadian Medical Association which will be reflected I hope, by many new memberships from New Brunswick.

Two reasons for this are apparent: first, the visits of extra-mural lecturers from central Canada, all of whom should be propagandists of the Dominion Association and second, the receipt of letters from the General Secretary on definite questions like the Lister Memorial and the policy of the Dominion Association.

A. STANLEY KIRKLAND

QUEBEC

Patients treated at Verdun clinic.—The opening of the new general clinic in Verdun which is to serve as a hospital outdoor department took place in June and patients are being treated in the various departments daily. It is located at 432 Church Avenue. The building has been entirely remodelled and the interior has been suitably repainted.

Only 100 students will be admitted to the first year medical course at McGill next year, according to a ruling of the faculty. Applicants for admission will be required to bring evidence of two years cultural work at some university, including courses in physics, biology and general organic chemistry. In addition each student must supply recommendations from two college professors and file details of his previous academic training and record. Already over 400 applications have been received from the United States and every province in the Dominion.

Trained nurses at call of passengers taken ill at sea.—The Canadian Pacific Steamships hereafter will carry a nurse on each of their passenger liners coming into Montreal; on some of the larger boats they have two nurses. The staff of the entire fleet is composed of Canadian and English nurses. These nurses rank as officers in the same way as did the Canadian Nursing Sisters who served with the Canadian Expeditionary Forces during the Great War. This comparatively new innovation is due in great measure to Lady Fisher, wife of the late Admiral Sir Thomas Fisher, who, while her husband was general manager of the Canadian Pacific Steamships fleet, took a great interest in the efficiency of this department.

Memory of late Dr. Springle honoured.—In the presence of many of those who had been intimately associated with the late Dr. John Anderson Springle in his work, a large bronze tablet was unveiled to his memory in the Western Division of the Montreal General Hospital. The ceremony took place in the Nurses'

Residence, the tablet being placed on a stand and covered with a Union Jack. John C. Newman, vice-president of the Montreal General Hospital, who presided, spoke of the high place which Dr. Springle held in the memories of those who had been associated with him in the practice of his calling. The inscription on the tablet reads as follows:

"In memory of John Anderson Springle, M.D., C.M. For over thirty years as surgeon and latterly as chief of the surgical department, he gave himself willingly for the benefit of the poor and needy. He was esteemed for his sympathy, his skill and his untiring devotion to his chosen profession. Born March 28th, 1864, died April 8th, 1925."

The tablet was presented by the Alumnae of the Western Hospital Nurses Staff and will be placed among the others already on the walls in the entrance to the hospital.

Lord and Lady Byng opened maternity wing of Hospital.—Lord and Lady Byng of Vimy opened the new maternity wing of the Royal Victoria Hospital on June 17th. At exactly four o'clock, the vice-regal motor drew up at the door and Their Excellencies accompanied by Lord William Scott, A.D.C., and Miss Sandford, lady-in-waiting, entered the hospital, where they were met by the reception committee, consisting of Sir Vincent and Lady Meredith, Lady Holt, Dr. and Mrs. Chipman, Mrs. George L. Cains, Miss F. L. Hersey, nurses' superintendent in the maternity wing, and H. E. Webster, superintendent of the Royal Victoria Hospital. The ceremony of the opening was very short. Sir Vincent after expressing the great honour and pleasure conferred by the presence of Their Excellencies, gave a résumé of the conditions which made the erection of the new maternity hospital necessary. He stated that the Royal Victoria Hospital would have the hearty co-operation of those whose philanthropy and interest had made possible the old Montreal Maternity Hospital. Lord Byng briefly responded.

ONTARIO

FORTY-SIXTH ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION

The 46th annual meeting of the Ontario Medical Association was held in London on May 25th, 26th, 27th and 28th. There were five hundred and forty members registered and an unusually good attendance was recorded as having attended

the various demonstrations and sessions. Of the papers presented sixteen were from Ontario, four from Canada elsewhere, and six from the United States. It was generally admitted that the programme was one of unusual excellence;

it was particularly appropriate to have had addresses from such doyens of the medical and surgical faculties as Dr. A. McPhedran of Toronto, and Dr. John B. Deaver of Philadelphia. As in the last two meetings of the Association all papers were presented in the general session; discussion of papers presented was particularly good.

On Tuesday evening the round table dinner and conference was conducted by the committee on inter-relations. One hundred and seven members attended and the gathering was presided over by Dr. A. J. Grant of London, discussion centred largely on such subjects as fee-splitting, medical education, public instruction, the narcotic drug evil and free medical service. On Wednesday the Board of Governors of the University of Western Ontario entertained the Association at lunch at the College of Arts; there was a dance at 9:00 p.m. at the Ontario Hospital.

On Thursday evening the Alumni of the various universities represented held their dinners, while on Friday a buffet luncheon was given at Victoria Hospital.

There was a large and interesting group of exhibits by various chemical, drug and instrument firms.

Sixty-five members of the committee on general purposes were present, meetings were held at 11 a.m. and 2 p.m. on Tuesday and at 10 a.m. on Wednesday. The meeting of the Board of Directors took place at 9:30 a.m. on Tuesday and the business meetings of the Association at 12 o'clock Thursday and Friday. The address of the President was delivered on Wednesday at the annual dinner held in the Ontario Hospital Amusement Hall.

The Committee on Nominations met at six o'clock on Tuesday. There were present Doctors John Macgregor, Edgar Brandon, A. J. McGanity, Norman Wallace, J. K. MacGregor, H. H. Alger, R. F. Slater, C. F. Dunfield, J. J. Williams, George Ramsay, Robert T. Noble, R. W. Mann, M. H. V. Cameron; Doctors Alger, Ramsay, MacGregor, Wallace and Williams acting as alternates. The Secretary explained the duties of the Nominating Committee and the following nominations were made:

President.—Dr. Edgar Brandon, North Bay.

1st Vice-President.—Dr. Weston Krupp, Woodstock.

2nd Vice-President.—Dr. E. A. McQuade, Trenton.

Secretary.—Dr. T. C. Routley, Toronto.

Hon. Treasurer.—Dr. G. Stewart Cameron, Peterborough.

Nominations for Counsellors were as follows:

District No. 1—Dr. A. J. Grant, London.

District No. 2—Dr. Ward Woolner, Ayr.

District No. 3—Dr. Malcolm Stalker, Walkerton.

District No. 4—Dr. J. H. Holbrook, Hamilton.

District No. 5—Dr. R. W. Mann, Toronto.

District No. 6—Dr. F. C. Neal, Peterborough.

District No. 7—Dr. L. J. Austin, Kingston.

District No. 8—Dr. J. A. Dobbie, Ottawa.

District No. 9—Dr. W. J. Cook, Sudbury.

District No. 10—Dr. John I. Pratt, Port Arthur.

Mr. J. H. Dignam of Toronto was named as auditor of the Association's accounts for 1926.

As regards the place of next meeting it was suggested that if the Canadian Medical Association meets in Toronto, the Ontario Medical Association should meet there with it, but that if the Canadian Medical Association does not meet in Toronto, the incoming Board of Directors is to decide the place of meeting for the Ontario Medical Association, bearing in mind the three invitations before the Committee from Kingston, Hamilton and Kitchener.

Further matters considered by the Nominating Committee were the division into two districts of counsellor district number two; the presenting of the written reports of the meetings by affiliated societies for inclusion in the printed business report for the annual meeting; the urging that all societies take part in contributing all medical news of interest.

The Committee on General Purposes held their first meeting on May 25th. The minutes of the last meeting were taken as read; the report of the Committee on Necrology was received with the members standing, it was noted that twenty-six of the Association had died in the last year. The roll is as follows:

Dr. D. O. Alguire, Cornwall.

Dr. Geo. M. Aylesworth, Trenton.

Dr. Chas. Ballantyne, Ottawa.

Dr. E. J. Barrick, Toronto.

Dr. Geo. W. Brown, Port Arthur.

Dr. C. M. B. Cornell, Brockville.

Dr. Wm. T. Harrison, Keene.

Dr. Alexander N. Hayes, Sarnia.

Dr. G. F. Jones, Webbwood.

Dr. William Logie, Sarnia.

Dr. J. B. Mann, Peterborough.

Dr. S. J. Mellow, Port Perry.

Dr. R. S. Minnes, Ottawa.

Dr. Wallace N. Moore, Englehart.

Dr. J. A. MacMahon, St. Catharines.

Dr. J. A. MacIntosh, Chippawa.

Dr. Walter McKeown, Toronto.

Dr. Peter McNaughton, Brockville.

Dr. James Newell, Watford.

Dr. I. W. Peck, Hensall.

Dr. F. H. Powell, Ottawa.

Dr. Geo. S. Ryerson, Toronto.

Dr. J. W. Smuck, Toronto.

Dr. Geo. S. Strathy, Toronto.

Dr. Peter Stuart, Guelph.

Dr. James Third, Kingston.

From the archives of the Association, the Committee abstracted the following short records of the activities of these deceased members:—Dr. G. M. Aylesworth was Vice-President in 1887 and acted frequently on committees.

Dr. D. O. Alguire assisted the Secretary in organizing the Stormont and Glengarry Medical Society as an affiliated branch of the Ontario Medical Association.

Dr. E. J. Barrick was an original member in 1881. He was the treasurer in 1890-1893, suc-

ceeding Dr. N. A. Powell who was the second treasurer. His name appears frequently on committees up to 1902.

Dr. W. G. Brown was one of the founders of the Thunder Bay Medical Society. A memorial tablet to him has recently been unveiled in the Port Arthur General Hospital.

Dr. J. B. Mann was local secretary for the Ontario Medical Association at the Peterborough meeting in 1915.

Dr. R. S. Minnes was Vice-President in 1917.

Dr. S. J. Mellow was a past president and a very active member of the Ontario County Medical Society.

Dr. Geo. S. Ryerson was an original member and in the early years of the Association did much valuable committee work.

Dr. George Strathy was Chairman of the Section of Medicine last year. He was assistant secretary 1909-1911.

Dr. Peter Stuart was for many years an active member of the Association, attending meetings and serving on committees.

Dr. James Third was Chairman of the Section of Medicine in 1916.

The report of the Board of Directors was presented by Dr. Routley. He stressed the following points. First—that the board had met five times since it took office, with a good attendance at each meeting. Second—that during the autumn months of 1925 there were ten counsellor district meetings, and that in addition to the scientific programme of these meetings, addresses were presented by the President and Secretary; that at the semi-annual business meeting held in Toronto, December 9, 1925, there was an attendance of sixty-five members, and that the business of the annual meeting, of dealing with affiliated societies, of free membership in the Association, of the treatments of indigents, of inter-relation, and of organization were actively gone into. As regards organization he noted that there are still fifty per cent of Ontario's doctors who are not members of the Association. The Secretary discussed at length the problem of educational funds, and noted that the Board of Directors has approved of the Association's accepting an appropriation of \$2,000 from the grant of \$30,000 given by the Sun Life Assurance Company to the Canadian Medical Association. The Secretary's report of the Board of Directors was considered clause by clause. The reports of the district counsellors, ten in number, were received and adopted. The division of District Number Two was left to the incoming Board of Directors. The Secretary presented the report of the Treasurer which is appended at the end of the details of the meeting. Dr. McLarty presented the report of the Committee on Credentials and Ethics.

It was moved by Dr. Routley, seconded by Dr. Woolner, that the affiliation of the Victorian

Order of Nurses with the O.M.A. be approved. This was carried.

The Secretary reported that the following gentlemen had been named by the Board of Directors as official delegates to the Canadian Medical Association meeting in June:

Dr. A. Primrose, Toronto.
Dr. Edgar Brandon, North Bay.
Dr. L. J. Austin, Kingston.
Dr. C. C. McCullough, Fort William.
Dr. G. Stewart Cameron, Peterborough.
Dr. V. E. Henderson, Toronto.
Dr. John Pratt, Port Arthur.
Dr. F. N. G. Starr, Toronto.
Dr. Geo. S. Young, Toronto.
Dr. F. J. Farley, Trenton.
Dr. J. G. Fitzgerald, Toronto.
Dr. J. H. Mullin, Hamilton.
Dr. Duncan Graham, Toronto.
Dr. A. J. Grant, London.
Dr. Weston Krupp, Woodstock.
Dr. James Miller, Kingston.
Dr. A. Sinclair, Sault Ste. Marie.
Dr. J. D. Curtis, St. Thomas.

The report of the Committee on Legislation and By-laws: a most comprehensive résumé was presented by Dr. John Ferguson. It was considered clause by clause, the act governing drugless practitioners, the regulations of this act, the inevitable trend as concerns cults, the Ontario Medical Act amendment, and the new by-laws of the O.M.A. were captions of the report. For the benefit of the members the wording of the Act, covering drugless practitioners is given in full, the regulations of the act are procurable at the office of the Association's Secretary:

I.—THE ACT GOVERNING DRUGLESS PRACTITIONERS

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as *The Drugless Practitioners Act, 1925*.
2. In this Act:—
 - (a) "Board" shall mean Board of Regents appointed under this Act;
 - (b) "Drugless Practitioners" shall mean and include every person who practises or holds himself out in any way as practising the treatment of any ailment, disease, defect or disability of the human body by manipulation, adjustment, manual or electro-therapy or by any similar method;
 - (c) "Regulations" shall mean regulations made under the authority of this Act.
3. (1) There shall be established a Board to be known as the Board of Regents to be composed of five persons to be appointed by the Lieutenant-Governor in Council.
- (2) Of the members of the Board first appointed, two shall hold office for a period of two years and three shall hold office for a period of one year, and thereafter every member appointed shall hold office for a period of two years, but any member shall be eligible for reappointment at the expiration of his term of office.
- (3) Every vacancy on the Board caused by the death, resignation or incapacity of a member shall be filled by the appointment of a person

to hold office for the remainder of the term of such member.

- (4) The Lieutenant-Governor in Council shall designate from time to time one of the members to be chairman, one to be vice-chairman and one to be secretary-treasurer of the Board.

4. The Board with the approval of the Lieutenant-Governor in Council may make regulations:—

- (a) for the admission of drugless practitioners to practise in Ontario and for the registration of all persons so admitted;
- (b) prescribing the qualifications of persons so to be admitted and the proofs to be furnished as to education, good character and experience;
- (c) for maintaining a register of persons so admitted to practise and providing for the annual renewal of registration and prescribing the fees payable thereon;
- (d) prescribing the discipline and control of registered drugless practitioners;
- (e) for classifying persons admitted to practise under this Act and for prescribing the systems of treatment which may be followed by drugless practitioners of different classes;
- (f) for designating the manner in which any person registered under this Act may describe his qualification or occupation and prohibiting the use of any title, affix or prefix which, in the opinion of the Board is calculated to mislead the public as to the qualification of any such person, and for allowing the use of any affix or prefix not forbidden by Section 49 of *The Ontario Medical Act* which in the opinion of the Board, will correctly describe the qualification or occupation of such person;
- (g) for the investigation of any complaint that a registered drugless practitioner has been guilty of misconduct or displayed such ignorance or incompetence as to render it desirable in the public interest that his registration should be cancelled or suspended;
- (h) for the cancellation or suspension of the registration of any person found by the Board to be guilty of misconduct or to have been ignorant or incompetent;
- (i) generally for the better carrying out of the provisions of this Act.

5. Nothing in this Act or the regulations shall authorize any person not being so expressly authorized under a general or special Act of this Legislature to prescribe or administer drugs for use internally or externally, or to use or direct or prescribe the use of anaesthetics for any purpose whatsoever, or to practise surgery or midwifery.

6. Every person who not being registered as a drugless practitioner under this Act, or who having been so registered and whose registration has been cancelled or is under suspension, who practises or holds himself out as practising as a drugless practitioner within the meaning of this Act, or who advertises or uses or affixes any prefix to his name signifying that he is qualified to practise as a drugless practitioner within the meaning of this Act shall be guilty of an offense and shall incur a penalty not exceeding \$100 and upon conviction for a subsequent offense within a period of two years after such first conviction shall be imprisoned for a period not exceeding three months.

7. Nothing in this Act contained shall apply to or affect:—

- (a) the practice of any profession or calling by any person practising the same under the authority of a general or special Act of this Legislature;

- (b) any nurse acting in the absence of, or under the prescription or direction of a legally qualified medical practitioner;
- (c) the furnishing of first aid or temporary assistance in cases of emergency;
- (d) persons treating human ailments by prayer or spiritual means as an enjoyment or exercise of religious freedom.

8. Nothing in this Act or the regulations shall be taken or deemed to relieve any person from compliance with the provisions of *The Public Health Act* or *The Vaccination Act*, or any amendment to either of them, or from compliance with the provisions of *The Vital Statistics Act* or any amendment thereto, or from any legal duty to provide for the treatment of any person by a legally qualified medical practitioner.

9. *The Ontario Summary Convictions Act* shall apply to prosecutions under this Act.

The Ontario Medical Act as amended should be read in order that the members of the Association may know and realize how far reaching have been the efforts of the committees and deputations appointed to consider this important modification of the laws under which they are allowed to practise and by which their interests are protected.

IV.—THE ONTARIO MEDICAL ACT AMENDMENT

The following very important amendment was made to the *Ontario Medical Act*. It is complementary to the Act governing drugless practitioners. It sets forth in very plain terms that all who are not on the register of the College of Physicians and Surgeons are restrained from using the term "Doctor," "Surgeon," or "Physician," etc.

AN ACT TO AMEND THE ONTARIO MEDICAL ACT

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as *The Ontario Medical Act, 1925*.

2. Section 49 of *The Ontario Medical Act* is repealed and the following substituted therefor:—

49.—(1) Any person not registered pursuant to this Act who takes or uses any name, title, addition or description implying or calculated to lead people to infer that he is registered under this Act, or that he is recognized by law as a physician, surgeon, accoucheur or a licentiate in medicine, surgery or midwifery, or who assumes, uses or employs the title "Doctor," "Surgeon" or "Physician" or any affix or prefix indicative of such titles as an occupational designation relating to the treatment of human ailments, or advertises or holds himself out as such, shall incur a penalty of not less than \$25 nor more than \$100.

(2) Subsection 1 shall not apply to any licentiate of dental surgery or any other person admitted to practise dentistry or dental surgery under the provisions of *The Dentistry Act* nor to any person registered as a pharmaceutical chemist under *The Pharmacy Act*.

3. *The Ontario Medical Act, 1923*, is repealed and notwithstanding anything in *The Interpretation Act* contained, such repeal shall have effect as if the said Act had never been enacted and all acts done and proceedings taken under and by virtue of the said Act are declared to be void and of no effect.

The new By-laws, two in number, dealt with the standing of ordinary members and with the question of temporary membership; their details are reprinted herewith:—

V.—NEW BY-LAWS

Two By-laws are submitted. The first one deals with ordinary members, and clears up all dispute or vague points regarding the admission, standing and rights of this class.

The second By-law deals with the question of temporary membership. It will be remembered that this very important matter was referred to the Committee on Legislation and By-laws, and was discussed at the semi-annual business meeting last December, and was again referred back to the affiliated Societies. These two By-laws are as follows:—

(a) Ordinary Members

(1) A legally qualified medical practitioner residing within the territorial area of a Medical Society, and desiring to become a member of the Ontario Medical Association may make a written application for membership on a form approved of by the said territorial Society, thereby conforming to the usages of the Society in the matter of the election of its members. The Application must be accompanied by the annual fee of the Ontario Medical Association. In the event of rejection this fee shall be returned to the applicant.

(2) Any legally qualified medical practitioner not desiring to become a member of his territorial Society, provided the said Society, by a two-thirds majority of its members present and voting at a regular meeting, has approved of the principle of membership at large, may make application to the Directors for membership in the Ontario Medical Association on a form for the purpose. The Application must be accompanied by the annual fee of the Ontario Medical Association. In the event of rejection by the Directors this fee shall be returned to the applicant.

(3) In all cases where membership in the Ontario Medical Association is sought in accordance with sub-section 2 hereof, the Directors may refer these Applications to the Executive of the Territorial Societies, within whose boundaries the said applicants reside for information as to their worthiness to become members.

(4) In the event of a member of one Territorial Society removing his residence into the jurisdiction of another Society, and severing his connection with the former, he shall be regarded as a member at large until such time as he may become a member of the latter Society.

(5) Members at large shall mean all who were original members of the Ontario Medical Association and who have not become attached to a local Society, or who became members while residing in a district where no local Medical Society exists, or who directly become members by the permission of the Territorial Societies, as set forth in sub-section 2 hereof, or who become residents within the territory of other Societies without becoming members of these, having withdrawn from the Societies in which they held membership.

(b) Temporary Membership

Membership in the Ontario Medical Association, upon the approval of the Board of Directors, is conferred automatically upon licentiates of the College of Physicians and Surgeons of Ontario, without payment of any fee, for a period extending to the end of the calendar year next following the year of their licensure, provided that, during the said period, they remain residents of the Province of Ontario, or engage in Post Graduate studies within the Empire. At the expiration of the said period, they shall elect the Territorial Societies in which they desire to hold ordinary membership, and shall, thereafter, become

liable for the fees of the same, and of the Ontario Medical Association. Subsequent to the free period, the annual fees in the latter Association shall be for the first year \$2.00, for the second year \$5.00, and for the third year \$10.00.

Sections 1, 3, 4, 5 of (a) were approved without opposition. Section (a) 2, was adopted by a vote of 19 to 6, Doctors Noble, Mann, Starr, Danard, MacGregor and Pratt opposing. (b) was amended to read:—

“Membership in the Ontario Medical Association upon the approval of the Board of Directors, is conferred automatically upon licentiates of the College of Physicians and Surgeons of Ontario, without payment of any fee, for a period extending to the end of the calendar year next following the year of their licensure. On entering practice in Ontario, they shall elect the affiliated societies in which they desire to hold ordinary membership and shall become liable for the fees of the same and of the Ontario Medical Association.”

There is general gratification that this question of the admitting of new members without fee for their first year, seems on the way to be settled.

The report of the Committee on Education dealt largely with the compiling and publishing of the new schedule of lecture subjects, the chairman of this Committee stressed the fact that in the post graduate lectures of the future, subjects will be discussed by members of the medical profession outside of the teaching faculties of the province.

Dr. N. A. Powell, Chairman of the Advisory Committee of the Board of License Commissioners, presented his report which closed with the following excellent remarks:— “The Ontario Temperance Act is one regarding which we are not called upon to form any official opinion. It may be the best ever devised or the worst that can be imagined. As it is given to us to see it, the thing of utmost importance is that our profession as a whole should maintain its dignity and its self-respect in the matter of prescribing liquors, as in all other things, and that every one of its members whose action, for any cause whatever, comes under review should be accorded absolutely fair and just treatment.”

Dr. E. A. MacDonald, Chairman of the Committee on Tariff, reported as follows:—

DISTRIBUTION OF SCHEDULE OF FEES

During the past year there has been sent out to every registered practitioner in the Province of Ontario a copy of the schedule of fees approved by the Association. Heavy cardboard was used, suitable for framing or hanging up in a doctor's office. Your Committee expresses the hope that this action on the part of the Association has been a benefit to the profession at large.

FEES

At the semi-annual business meeting held in December, your Committee presented an *interim* report, being a suggestion from the Essex County Medical Society as follows:—

For a major operation when the patient is charged \$125.00, the following is a suggested division:—

Anæsthetist	8%—\$10.00
Diagnosis and assistance	20%—\$25.00
Operator	52%—\$65.00
After treatment for two weeks in hospital	20%—\$25.00

It was decided that this information should be forwarded to each affiliated Society in the Association with the request that the delegates to the Committee on General Purposes at the Annual Meeting be prepared to discuss the matter.

It was moved by Dr. MacDonald, seconded by Dr. Hutchison that this report be received for consideration. Carried. After consideration, it was moved by Dr. McDonald, seconded by Dr. Krupp, that Clause 1, dealing with the printing and distribution of the schedule of fees be adopted. Carried.

Dr. Powell:—Diagnosis is complete after the incision is completed. I heartily disapprove of the proposed schedule.

Dr. Binns:—It was unanimously decided by the Welland County Medical Society that the suggested division of fees was "utter rot". We wish to go on record as being entirely opposed to such a division.

Dr. F. N. G. Starr:—The statement that the diagnosis is made after the operation is completed might be true where the surgeon accepts the physician's diagnosis. The suggested division of fees would lead to all sorts of improper acts. I could conceive, as time goes on, that lack of care in carrying out a matter of this kind would mean that the patient would not know what was being done with his money. We should protect the public and this is not a method of protecting the public. It would be better to have a trained assistant come in and assist the surgeon than to have the family physician who is not accustomed to the work. I think the physician is entitled to every dollar he has earned, but I am opposed to any such division of fees.

Dr. MacGregor, (Hamilton):—I do not altogether agree with Dr. Starr because the great bulk of surgery in this province is not done with trained assistants. I do not think this Association should let this matter go by the Board without seriously considering Dr. McDonald's motion because it seems to me that some solution should be made to the fee question to do away with just the condition that Dr. Starr has mentioned. I do not agree with this Clause of this report *in toto* but I think it could be reasonably considered. In the great majority of cases operated on, the assistants in this province are the men in general practice. A great many people object to paying the amount required for assistance at an operation. If that were properly placed on our schedule, I think it would do away with a great deal of trouble. Some plan must be looked for to get away from this, because we cannot close our eyes to the fact that the great bulk of

the profession in this province think they are not used rightly by surgeons in general. Some plan should be worked out to get a proper standing on our schedule of fees for the man who assists at an operation. I am not in favour of any division of fees that is not above board.

Dr. Geo. S. Young:—Underlying this whole question is the fact that the general practitioner is not considered by the patient to have rendered valuable service. To try and remedy that by such a scheme as suggested is wrong. The public will never grasp the difference between the division of fees and the splitting of fees. To adopt such a course would be to attach to ourselves a stigma. A great deal could be done by the surgeon if he would call attention to the work of the physician in his handling of the case. I believe the amount of the fee should be based upon the amount of time occupied and work in the treatment.

Dr. Hogarth, Fort William:—The Thunder Bay Medical Society unanimously refused to have anything to do with the suggested division of fees.

Dr. A. J. Grant, London:—I think the principle involved in this division would be highly dangerous. This is not the way to better the condition of the general practitioner. We should not lend ourselves to a principle which would lead us into wrong lines.

Dr. E. E. Binns, Welland:—From the standpoint of the anæsthetist, we feel that each man should make his own charge in accordance with the exigencies of the case.

After considerable discussion as above, an amendment was moved by Dr. Powell, seconded by Dr. Binns, that Clause 2, dealing with the proposed division of fees in surgical cases, be deleted. Carried. The main motion was declared lost.

Dr. G. A. McLarty reported for the Committee on Mental Hygiene and said that the Committee has made some progress during the past year, but still feels that there is considerable lack of interest in the neuro-psychiatric problems, and until some interest is stimulated, progress must necessarily be slow. The Committee feels that if the instruction and teaching at the universities were more clinical, the graduates would be better equipped to deal with mental problems that arise in general practice. The Committee referred again to their recommendation to the provincial secretary "that further institutional provision be made for mental defectives." They noted that no action had been taken by the Ontario Neuro-Psychiatric Association regarding affiliations with the Ontario Medical Association. They suggested co-ordination of the many organizations carrying on mental hygiene activities, and finally they stressed the importance of bringing to the attention of the department of health

the necessity of making spinal fluid examinations of special treatment cases.

Dr. F. J. Farley, Chairman of the Committee on County Health Centres, made the report that at Bancroft in North Hastings, plans are rapidly maturing for the establishment of a hospital. Representatives of the Committee supported by the Ontario Division of the Canadian Red Cross, addressed the Hastings County Council on this subject and lent such assistance as they could to the promotion of the project.

Dr. J. W. S. McCullough made the report for the Committee on Public Health. This included the vital statistics of the communicable diseases and amongst them were to be noted the figures dealing with the venereal diseases, chaneroid, gonorrhoea and syphilis. The report takes notice of no less than 218 cases of smallpox, and 959 cases of typhoid. It states that the incidence of scarlet fever has been much reduced and speaks hopefully as regards the obtaining of an anti-toxic serum for this disease. The chairman urged the formation of larger local health areas with full timed trained medical officers of health, he also submitted that the time had arrived when legislation should be enacted which should enable municipalities to combine for public health purposes. The committee of which he was chairman had also been appointed to make a study of free medical service and reported on the question as follows:—"We would recommend that either the Committee on Inter-Relations or the Committee on Public Health take up the matter of requesting the Department of Health to secure such legislation as would make compulsory: (1) school inspection in rural districts; (2) provision for appointment of school medical officers with satisfactory remuneration; (3) provision for financial care (medical and hospital) of those children unable to pay."

This report was submitted by your Secretary to the Committee on Public Health asking if the matters referred to therein should receive the attention of this Committee. These matters were accordingly submitted to the Committee and the following constitutes their views:—

- (1) Compulsory school medical inspection in rural areas would be likely to stir up opposition on the part of the ratepayers. Besides, it cannot satisfactorily be carried out with our part-time system of medical officers of health.
- (2) Provision for the appointment of school medical officers with satisfactory remuneration. It is deemed inadvisable to make this compulsory, as it would be certain to arouse strenuous opposition amongst the taxpayers.
- (3) Provision for the care (medical and hospital) of the children unable to pay. This is now the duty of the municipality under Sec. 52, S.S.1 of *The Public Health Act*.

The report of the Workmen's Compensation Board Committee, by Dr. Marlow, stated that at

the last annual meeting your Committee, appointed to consider Workmen's Compensation Board matters, presented a lengthy resolution recommending re-organization of the Workmen's Compensation Board. Your Committee now has to report that last November it met Mr. Nickle, the Honourable Attorney General and Mr. Sinclair, Chairman of the Workmen's Compensation Board, when an opportunity was presented to discuss the resolution clause by clause. Although no assurance was given us that our recommendations would be accepted by the Government, your Committee felt that the conference had been of distinct value in as much as many points of mutual interest were discussed and clarified.

The Committee on Hospitalization reported that it had held a preliminary meeting in Toronto in December, 1925, at which it had discovered that the grounds of investigation were being covered by the Ontario Hospital Association; it had decided that it would be better to co-operate with this Association and that, therefore, it recommended that the question of hospital costs be studied in conjunction with the Ontario Hospital Association.

It also recommended that the Ontario Hospital Association be asked to enlarge its Executive Committee and to appoint one member on it to represent the Ontario Medical Association. Should this be agreeable we feel that this Committee would be of no further use and we would, therefore, recommend that we be discharged.

The report of the Committee on the Treatment of Indigents was presented by Dr. John Ferguson; Dr. Ferguson quoted the words of the resolution of the Medical Society of Sault Ste. Marie which read as follows: "Now, therefore, be it and it is hereby resolved that we, the Medical Association of the City of Sault Ste. Marie, petition the Legislature of the Province of Ontario to, at the next session of Parliament, enact Legislation which will provide for proper and reasonable remuneration for medical practitioners called upon from time to time to administer, treat and care for indigent patients in unorganized territory in the Province of Ontario, whether they be confined to hospital or not."

Dr. Ferguson stated that to meet the conditions set out in the resolution from the Association at the Sault, it would be necessary to pass new legislation, or to amend The Public Health Act, or The Municipal Act so as to extend their provisions for the care of the poor into unorganized districts. The simplest way would be that of suitably amending The Public Health Act by adding another Sub-Section to Section 52 already quoted.

He continued that it does seem very strange

that Section 52 of the said Act should state: "The Corporation of every municipality shall enter into an agreement with the medical officer of health or some other legally qualified practitioner, resident in the municipality or in a municipality adjacent thereto, for his medical attendance upon and care of persons suffering from the result of injuries or disease who in the opinion of the head of the municipality or its relief officers, if any, are unable through poverty to pay for the necessary attendances and who are not cared for in the public or private hospitals."

The Chairman further remarked it must strike every fair minded person that the indigent poor in unorganized districts are just as much entitled to medical and surgical care and attention as are the indigent poor in an organized municipality. The difficulty, however, exists that there is no one in the unorganized districts who can enter into a contract with a practitioner for the required professional services. This could be overcome by the Government making the arrangements in the stead of the municipality.

The report of the Committee on Industrial Medicine presented by Dr. V. E. Henderson took the form of a detailing of the Toronto meeting of Industrial Medical Officers held on December 9th, 1925. At this meeting Dr. O. A. Cannon, presented a report of the sub-committee on notification of industrial diseases. This report contained the following important recommendations:

The suggestion is put forward that an approach be made to the proper authority to have provision made in *The Public Health Act* somewhat as follows: "Every medical practitioner attending on or called in to visit a patient whom he believes to be suffering from anthrax, lead poisoning, mercurial poisoning, phosphorus poisoning, arsenical poisoning, ankylostomiasis, miner's phthisis, benzol poisoning, silicosis, or any other disease which the medical practitioner believes to be due to the occupation in which the patient is employed shall duly notify the proper authorities." The form suggested should give the name, age, address, where employed, full duties of his occupation, and the details of the signs and symptoms shown. The medical officer of health is the official to whom we are accustomed to send reports; he has a staff of inspectors, he reports regularly to the Provincial Department and is the local authority who deals with any condition which is a menace to health and is the logical one to receive the reports. The practice of listing certain diseases and stopping there is not to be recommended. It closes the door to conditions not listed and would defeat the purpose for which notification is desirable, viz., the study of the indefinite conditions. Therefore, the clause should be so framed that even those industrial sicknesses to which the doctor cannot assign a name would nevertheless be reported.

Payment for these reports is not recommended at present as they are in no way different from other reports required under Provincial Statutes and for which the physician has not been paid. It would be expected that the Provincial Department of Health would regularly supply the practitioners of the province with bulletins giving the information which it has been possible to compile from these reports.

The report of the Committee on Inter-Relations was presented by Dr. J. W. Crane. No regular meeting of the Committee had been held during the year and no report of work accomplished was presented to the meeting. The Committee suggested that the round table dinners be continued at the open forum for discussion of the medical problems of the profession and have put forward as subjects for debate the following:—fee splitting, public instruction, periodic health examinations, medical organization, the narcotic drug evil, free medical service.

The Chairman of the Historical Committee presented his report with many pointed suggestions. Dr. Ferguson stressed the importance of medical men and societies taking steps to get in touch with the family or estate of a departed physician asking for permission to view his belongings and to point out things of value to the medical profession, such as attendance cards, medical school calendars, diplomas, etc. He also made the following suggestions:

But to achieve good results in any undertaking some system must be adopted. With the object of making a start in the matter of collecting data, it is recommended that each affiliated Society appoint one of its members to the office of Historian. It would be his duty to collect all possible information bearing upon the past history of medicine in the District covered by the Association which he represents. This information might very properly contain such material as the following:—

1. Who have represented the District on the Council of the College of Physicians and Surgeons, and any information that can be ascertained about them and what they accomplished.

2. Members of the profession of the said District that have held offices and what offices in the Ontario Medical Association, with dates.

3. The history of the Medical Society of the said District, with careful reference to any action by it on matters of public health or other utilitarian movements.

4. The foundation and development of charitable institutions in the District, such as hospitals, asylums, homes for the aged, houses of refuge, etc., etc.,

5. Historical references to members of the profession who may have rendered important services to the public by sitting in the Federal or Provincial Parliaments, occupying positions on School Boards, in the Council of the Municipality, or who have been active in founding hospitals, etc.

6. Careful note should be made of any important papers contributed on subjects of medical science, and by whom, with dates, and nature of the subjects discussed.

7. Newspaper items dealing with medical meetings or other medical events, such as the one by Janet Carnochan about Dr. Hadley Anderson in the *Globe* of November 21st, 1925, obituaries of doctors, medical trials, etc., should be preserved, stating the paper from which the items were taken, and the dates.

8. All this information and newspaper clippings, should be forwarded to the General Secretary, not later than the end of March of each year in order that it may be available for the Historical Committee for the purposes of its annual report.

9. On the death of a doctor, the Historian of the District should see or communicate with the relatives or executors with the object of securing books of value, case books, medical records, letters of medical men, historical data, etc., etc.

10. All the information furnished by the Historian of each District should be filed in a scrap book kept for each District.

The report of the Honorary Treasurer, Dr. G. Stewart Cameron is inserted for the benefit of the members of the Ontario Medical Association, who should know what an important detail is this part of the Association's agenda.

ONTARIO MEDICAL ASSOCIATION
REVENUE STATEMENT FOR THE YEAR ENDED
31ST DECEMBER, 1925

<i>Receipts</i>	
Membership Fees	\$17,691.98
Interest—	
Bank	\$229.58
Bond	471.40
	700.98
Sundry Revenue	200.22
Annual Meeting	1,304.06
	<u>\$19,897.24</u>
<i>Expenditures</i>	
Salaries	\$6,675.00
Clerical Assistance	80.50
Office Supplies	402.78
Postage	723.11
Telephone and Telegraph	320.63
Travelling Expenses	775.70
Speakers' Expenses	2,942.60
Printing	605.69
Bank Charges	358.80
War Tax	20.98
General Expense	230.09
Auditor's Fee	50.00
Directors' Expenses	236.33
Depreciation written off Furniture and Equipment	98.50
BALANCE CARRIED DOWN TO CREDIT OF ASSOCIATION SURPLUS ACCOUNT	6,376.53
	<u>\$19,897.24</u>

BALANCE SHEET AS ON 31ST DECEMBER, 1925

<i>Assets</i>	
Furniture and Office Equipment, as on 31st December, 1924	\$1,970.21
Additions, 1925	171.03
	<u>\$2,141.24</u>
Less Depreciation, 5% written off	98.50
	<u>\$2,042.74</u>
Bonds—	
\$5,000 Can. Nat. Ry. 5%, 1954 ..	\$4,802.53
\$5,000 C.P.R. 4½%, 1944	4,685.30
\$6,000 Dom. Can. 4½%, 1940	5,857.93
	<u>\$15,345.76</u>
Cash at Bank	3,650.69
	<u>\$21,039.19</u>
<i>Liabilities</i>	
Surplus in favour of O.M.A., Dec. 31, 1924	\$14,662.63
Brought down from Revenue Account	6,376.53
	<u>\$21,039.19</u>
Surplus in favour of O.M.A., Dec. 31, 1925	<u>\$21,039.19</u>
Audited and found correct.	
Dated, 30th March, 1926.	

J. H. DIGNAM, Auditor.
NORMAN GWYN

NINETEENTH ANNUAL MEETING OF THE
ACADEMY OF MEDICINE*

The nineteenth annual meeting of the Academy of Medicine of Toronto was held on May 4th at 13 Queen Park. The attendance was good, and all reports were received with much interest. The report of the council gave a summary of the year's work, from which we abstract the following: steady progress has been satisfactorily maintained during the past year. Fifty-five new members have been added to our roll and the revenue has been increased accordingly. Both the stated and general meetings of the various sections have had a larger attendance than ever before, a matter very gratifying for those responsible for the programme. The aim of the programme committee has been to appeal specially to men in general practice; more clinical meetings have been held than in previous years. The special advisory committee appointed was of great service to the programme committee. This advisory committee is recommended to be continued, thereby preserving a steadiness and continuity not otherwise attainable.

The subscription dinners have been well attended and very enjoyable. In the interest of good comradeship a golf field day was held on October 16th. A committee is now in charge of arrangements for a tournament to be carried on through the summer, to be terminated by another field day in the autumn.

A committee has been appointed to enquire into and make recommendations regarding the nursing situation. It is to be hoped that its efforts will result in great good both to the nursing and medical professions and to the general public. During the past year we have listened to interesting addresses from many distinguished men: Lord Dawson of Penn, Sir Arbuthnot Lane, Professor W. Blair Bell, and Mr. Basil Graves, from England; Dr. Jacques Forrester from France; Dr. Charles Gilmour Kerley, Professor Kenneth Blackfan, and Dr. Donald Balfour from the United States; also Dr. A. T. Bazin, Dr. Charles Hunter, Dr. J. J. Heagerty, Professor Currelly, Dr. W. J. MacDonald, Professor James Miller, and Dr. W. B. Howell, from our sister universities in the Dominion.

The outstanding business of the past year has been the appointment of committees from the Academy of Medicine and the University of Toronto, with the mutually expressed desire that an amalgamation of the libraries of the Medical Faculty of the university and of the academy should take place. The consummation of such an amalgamation will be a truly great event, and will open up a prospect of greatly increased influence and dignity for our Academy. At the close of the meeting the following officers were elected: President, Dr. F. N. G. Starr; vice-president, Dr. A. J. McKenzie; honorary secretary, Dr. R. S. Pentecost; honorary treasurer, Dr. Brefney O'Reilly. The following were elected as members of the council; Drs. H. B. Anderson, M. H. V. Cameron, F. A. Clarkson, J. T. Fotheringham, W. E. Gallie, Dennis G. Jordan, William Magner, R. W. Mann, R. T. Noble, D. E. Robertson, J. W. Ross, and Wm. Harley Smith. (Abstracted from the *Canada Lancet & Practitioner*, June, 1926).

* By an unfortunate oversight this report failed to appear in our July number for which it was intended.

COMPLIMENTARY DINNER TO DR. R. W.
POWELL

Our good friend Dr. Powell this year has reached the fiftieth anniversary of his graduation in medicine. His confrères in Ottawa took advantage of the occasion to tender him a complimentary dinner, and also present him with a handsome gold filled travelling bag, at the Royal Ottawa Golf Club. Some fifty members of the profession were present with Dr. J. F. Kidd presiding.

In making the presentation on behalf of those present, Dr. I. L. Chabot, M.P., spoke as follows: "Fifty years ago Dr. Powell graduated with the highest honours being the Holmes Medalist at McGill. Since that time, as a physician and surgeon, as a citizen and as a gentleman, he has laboured in our community and has at all times been an outstanding figure, and it certainly must be a cause of pride and a source of great satisfaction for a man to know that he has rendered good service in a large and very important sphere of activity during that period of time."

Dr. Powell, your initiative in many things pertaining to the welfare of our profession, your progressiveness as a Canadian and a citizen of Ottawa, your devotion to your duties, your love of your profession and last, but not the least, your loyalty to your friends have endeared you to a very wide circle of friends and have earned for you the deep gratitude of hundreds of patients.

There are many whom we look upon as "good fellows"; but I think I can qualify and describe you without fear of contradiction as a prince among good fellows. Your life has been replete with usefulness. May it continue as such for many years to come, and I feel that I am voicing the feelings of all those here present when I express the hope that the end to your path of life may be in the very far distance. In the meantime, do not make it too straight or too narrow but just fairly wide, and I sincerely trust that it may at all times be abundantly strewn with contentment and happiness.

I have very much pleasure in presenting you with this travelling bag which we, your many medical friends seated around this festive board, desire you to accept as a token of our goodwill, our esteem, our admiration, yea, of our affection for you.

Long may you wave and long may you travel, and in conclusion let me say that we all desire that your shadow may never grow less."

In responding Dr. Powell very feelingly thanked the speakers for their very kind remarks and expressed his hearty appreciation of the honours conferred upon him by those present. He had always endeavoured to deserve the confidence of his fellow-practitioners but the present occasion was such that he felt he could not fully express the feelings that arose within him. The remembrance of the evening and his many old friends would be dear to him and he trusted that for years to come there would remain the same friendship and confidence.

On May 14th, at a meeting of the Oxford County Medical Society held at Woodstock, Dr. W. E. Gallie of Toronto gave an address on "Sprains and other injuries to the ligaments and joints."

The Simcoe County Medical Society met at Barrie on May 18th, Dr. Ogden gave a talk on "Various types of onset in pulmonary tuberculosis", with lantern slide illustrations.

At a meeting of the Welland County Medical Society held at Welland on May 18th, Dr. W. P. Tew of London gave a talk on "The management of certain obstetrical emergencies."

The Norfolk County Medical Society met at Simcoe on May 18th, Dr. J. Hepburn of Toronto gave a talk on "The diagnosis, prognosis and treatment of cardiac irregularities."

On May 28th, Dr. C. S. Wright of Toronto addressed the Northumberland and Durham Medical Society on "Chronic arthritis."

At a meeting of the Lincoln County Medical Society

at St. Catharines on June 2nd, Dr. R. D. Rudlof of Toronto spoke on "Rational empiricism."

Dr. P. M. Andrus of London addressed the Perth County Medical Society at Stratford on May 20th, taking as his subject, "Current thoughts on tuberculous infection and immunity."

Dr. A. A. Fletcher of Toronto addressed the Perth County Medical Society at Stratford on June 3rd, his subject being, "Insulin, its uses and abuses."

The Porcupine District Medical Society met at Timmins on June 3rd, Dr. Geo. A. Ramsay of London spoke on "Fractures."

On June 9th, at a meeting of the Grey County Medical Society held at Markdale, Dr. R. G. Armour gave an address on "The diagnosis and treatment of encephalitis lethargica."

The Hastings County Medical Society met at Tweed on June 11th, Dr. R. I. Harris of Toronto addressed the meeting on the subject of "Burns."

Dr. F. B. Bowman of Hamilton addressed the Simcoe County Medical Society at Allandale on June 15th, his subject being "Gastric and duodenal analysis with special reference to non-surgical biliary drainage."

On June 16th, Dr. A. J. Grant of the Western University Medical School, London, visited the Thunder Bay Medical Society, giving a talk on "The more common ailments of the rectum and anal canal."

At a meeting of the Renfrew County Medical Society held at Renfrew on June 24th, addresses were given by Dr. C. A. Rae of Toronto, on "Ulceration of the mouth, pharynx and tongue," and Dr. W. J. Stevens of Ottawa on "Obstetric synergistic analgesia."

Dr. A. S. Moorhead of Toronto addressed the York County Medical Society at Sutton, on June 24th, his subject being "Diseases of the rectum."

The annual meeting of the Simcoe County Medical Society was held at Wasaga Beach on June 24th when the following addresses were given: Dr. W. P. Tew, London, "The management of certain obstetrical emergencies"; and Dr. W. Goldie, Toronto, "The importance of the medical history in the diagnosis of chronic gastro-intestinal disease."

The Northumberland and Durham Medical Society met at Bowmanville on June 30th. Addresses were given by the following: Dr. F. J. H. Campbell, London, "The diagnosis of nephritis"; and Dr. W. G. Cosbie, Toronto, "The management of certain obstetrical emergencies."

The Thunder Bay Medical Society held a day of clinics at Fort William and Port Arthur, followed by an evening meeting on Monday July 12th, when they were addressed by Doctors L. J. Austin, Kingston, J. H. Mullin, Hamilton and J. G. FitzGerald, Toronto, who were returning from the annual meeting of the Canadian Medical Association in Victoria, B.C. Dr. Austin spoke on "Injuries to the elbow in children," Dr. Mullin, on "Insulin," and Dr. FitzGerald, on "Specific prevention of disease."

The Harvey Club of London met on June 22nd, Dr. S. M. Fisher addressed the meeting taking as his subject "Some reflections on pain."

Dr. H. W. Aikins, the registrar of the College of

Physicians of Ontario makes the following announcement concerning the final examinations held in May and June of this year: 143 candidates wrote on the examination; of these 132 were successful and received the licentiate. They were graduates of the following universities: University of Toronto, 112; Queen's University, 7; University of Western Ontario, 6; McGill University, 6; University of Pittsburgh, 1. N. B. GWYN.

The June meeting of the York County Medical Society was held at the home of Dr. Edwards in Sutton on the afternoon of Thursday, June 24th. Dr. Andrew S. Moorhead, of Toronto, addressed the Society on "Diseases of the rectum." The attendance was good and the address and subsequent round table discussion were greatly enjoyed by all present. S. W. OTTON

COLLEGE OF PHYSICIANS AND SURGEONS OF ONTARIO

MEMBERS ADMITTED TO THE COLLEGE, JUNE 12TH, 1926, BY EXAMINATION

Charles Albert Arnott, 335 Armadale Ave., Toronto 9; George Rupert Balfour, 20 Pauline Ave., Toronto 4; Lyman Tullus Barclay, R.R. No. 2, Claremont, Ont.; Norman John Barker, 83 Langley Ave., Toronto 6; Stanley Richard Bennett, 41 Maple St., St. Catharines, Ont.; Reuben Herbert Breslin, 269 College St., Toronto 2; Frederick Bruce Brintnell, Box 253, Colborne, Ont.; John Harold Burgess, 127 Huron St., Ottawa; Charles Frederick Burt, 136 Brant Ave., Brantford; Molson Carl Cain, Huntsville, Ont.; Hugh MacLaren Cameron, 61 5th Ave., Ottawa; Ivor Campbell, 32 Albany Ave., Toronto 4; James Gerard Campbell, 815 Bathurst St., Toronto 4; Harry Gordon Carleton, R.R. No. 1, Roslin, Ont.; Charles William Carr, R.R. No. 3, Thornton, Ont.; Joseph Seymour Chaikoff, 95 Nassau St., Toronto 2; Walter James Kilburn Clothier, 520 Bay St., Ottawa; Hugh Schofield Coulthard, Wycliffe College, Toronto 5; John Francis Cray, 252 Dublin St., Guelph, Ont.; Gordon Slade Cumming, 31 Barthe St., Chatham, Ont.; William Lorne Deeton, 379 Huron St., Toronto 5; Wilfred John Beckett Derbyshire, "Sunnyside", Weston Coyney, Stoke-on-Trent, England; Russell Tweedie Dingle, Burlington, Ont.; Mallory Charles Christopher Dorsey, R.R. No. 4, Cookstown, Ont.; John Frederic Dreyer, Hung Tung, Shansi, North China; Edward Morrison Dundass, 81 Ridout St., London; Norman Lewis Easton, Aytton, Ont.; Cecil Wilbur Ely, Box 129, Beamsville, Ont.; Alexander Benjamin Fairfield, Box 89, Beamsville, Ont.; John Franklin Farnsworth, Cannifton, Ont.; Ellis Mack Vaughn Fielding, 216 Lundy's Lane, Niagara Falls, Ont.; Jacob Maxwell Fine, 275 Crawford St., Toronto 3; Edward Waller Flahiff, Box 224, Paris, Ont.; Evelyn Mary Fleming, "Donlands", Toronto 6; Francis James Fleming, Box 235, St. Marys, Ont.; Samuel James Forrest, 77 Edith Drive, Toronto 12; Arthur Coulson Fowler, Perth, Ont.; Francis Traill Fralick, 49 Belvidere Ave., Toronto 10; Ruth MacLachlan Franks, Apt. B., 57 Charles St., W., Toronto 5; William James Gardiner, 211 Queen St., Midland, Ont.; Albert Henry Gies, 181 Oak Ave., Hamilton; Joseph Patrick Gilhooly, Chateau Apts., Sherbrooke St., Montreal, Que.; James Noel Gillies, Port Daniel Centre, Que.; Sandford Fleming Goodchild, 272 Poplar Plains Road, Toronto 5; James Clifford Goodwin, 8 Woolfrey Ave., Toronto 6; Cyril Bertram Graham, Oakwood, Ont.; Cecil William Hain, 136 Osler Ave., Toronto 9; Arthur Worth Ham, 71 Charlotte St., Brantford; Clarence Edward Albert Hassard, 120 Grace St., Toronto 3; Charles Alexander Joseph Hemond, 329 Windsor Ave., Windsor; Harold Adelbert Henderson, Hyde Park, Ont.; Frank Reuben, Henné Gananoque, Ont.; Roger Frederick Hisey, Creemore, Ont.; John Peter Hobson, 610 Ellis St., Niagara Falls, Ont.; Lawrence Hooley, North Bay, Ont.; Norman Lloyd Hooper, Box 91, Little Britain, Ont.; Helen Doris Howell, 30 Bald St., Welland, Ont.; Henry

Dewey Louis Hudson, 164 Glendonwynne Road, Toronto 9; Reginald Grieve Huff, 290 Spadina Road, Toronto 10; Samuel Bernard Hurwich, 115 Markham St., Toronto 3; Arthur Patrick Ridout James, 431 Palmers-ton Blvd., Toronto 4; Thomas James Jamieson, Ohsweken, Ont.; Edward Thomas Jessop, 8 Lakeview Apartments, Toronto 3; Grant Hortop Jones, R.R. No. 2, Claremont, Ont.; Gordon Carlos Kelly, 210 Victoria Ave. North, Hamilton; Samuel Victor King, Box D, Cobourg, Ont.; James Gordon Kirk, Glanworth, Ont.; John Harold Kreiner, 142 Queen St. South, Kitchener, Ont.; Louis Victor William Vincent Lang, 74 West Weber St., Kitchener, Ont.; Laurence Ross Leaver, R.R. No. 1, Port Credit, Ont.; Frederick LeDrew, 293 Huron St., Toronto 5; John Llewellyn Little, 217 Paisley St., Guelph, Ont.; Howard Evans Dainty Lowrey, St. David's, Ont.; Lorne Albert Lyon, R.R. No. 1, Oakville, Ont.; Robert Wellington McBain, c-o Mrs. G. Les. Davidson, R.R. No. 1, Dunedin, Ont.; John Duncan McCallum, Lloydtown, Ont.; Wilfrid Alexander McCannel, R.R. No. 2, Chesley, Ont.; Ray Darwin McCombs, R.R. No. 8, Dunnville, Ont.; Norman Arnold McCormick, 25 Wyandotte St., Walkerville, Ont.; Donald Fraser McDonald, 517 Brunswick Ave., Toronto 4; Peter William McDonald, Box 234, Colborne, Ont.; Andrew Russel McGee, c-o Samuel McGee, Norwood, Ont.; Douglas Urquhart McGregor, 250 Main St., East, Hamilton; Clyde Turner McGuire, 2 Turner St., Merriton, Ont.; Reginald Eric McMullen, 23 Norwood Road, Toronto 13; Donald Marshall Macpherson, 106 Elmwood Ave., London; Bernard Abraham Manace, 9 Rosemount Ave., Toronto 10; Gordon Manace, 9 Rosemount Ave., Toronto 10; Ferdinando Mancuso, 1095 Green Ave., Westmount, Que.; Lorne Wilfred Mason, Box 527, Simcoe, Ont.; Percy William Mason, Box 527, Simcoe, Ont.; James Elmo Mayne, Box 107, Drayton, Ont.; Hugh Kenneth Moir, 41 Riverdale Ave., Toronto 6; Leslie Lloyd Murray, Guy's Hill, Jamaica, British West Indies; Sydney Stewart Murray, Box 292, Dundas, Ont.; Wellington Eric Ethelbert Neelin, Richmond, Ont.; Thomas Frederick Nicholson, 188 Glencairn Ave., Toronto 12; Edgar Owen Nunez, 521 East 138th St., New York, N.Y.; Daniel James O'Ray, 38 Clergy Street, Kingston; Melville Joseph Ormerod, 55 Westlake Ave., Toronto 13; Thomas Donald Park, 35 Nanton Ave., Toronto 5; William Patrick Emery Paterson, Westmeath, Ont.; Harry Elwood Peart, Box 76, Burlington, Ont.; Francis Reginald Pember, 29 Frizzell Ave., Toronto 6; David Wilfred Pratt, 41 Boswell Ave., Toronto 5; Thomas Archer Rendle Reeve-Newson, Campbellford, Ont.; Helen Smalley Robinson, Kleinburg, Ont.; Ralph Archibald Ruby, Box 346, Kemptville, Ont.; Philip Bernard Rynard, Uxbridge, Ont.; Reginald Francis Scott, 65 Laplante Ave., Toronto 2; Cecil Gordon Shaver, R.R. No. 1, Jerseyville, Ont.; Isadore Irwin Sidenberg, 93 Dovecourt Road, Toronto 3; Arthur Gordon Smith, 173 Cambridge Ave., Toronto 6; William Edward Smith, 221 Rosslyn Ave. North, Hamilton; Samuel Soskin, 132 Nassau Street, Toronto 2; Henry Munro Irving Sparks, 472 West Marion Street, Toronto 3; William Charters Sprout, Kippen, Ont.; Harold Frederick Stahl, 14 Stahl Ave., Kitchener, Ont.; Oscar John Stahl, 14 Stahl Ave., Kitchener, Ont.; Donald Lionel Morris Strebig, Apartment 17, 83 Silver Birch Ave., Toronto 8; James Norman Pierson Struthers, 19 Aberdeen Club, Bain Ave., Toronto 6; Kenneth Stuart, R.R. No. 4, Simcoe, Ont.; Joseph Taylor Albert Sullivan, 13 Deer Park Crescent, Toronto 5; Theodore Allen Sweet, 268 Aberdeen Ave., Hamilton; Harrison Russell Teasdale, Massey, Ont.; August Franklin Thaler, Elmwood, Ont.; Henry Edmund Peter Vale, 75 Huntley St., Toronto 5; Harry Abraham Warwick, 158 Earl Street, Kingston; John Laxton Watson, 177 Dowling Ave., Toronto 3; Clifton Rennie Weber, 1329 Ouellette Ave., Windsor; Leslie Frank Wilcox, Beeton, Ont.; Herbert Norman McDougall Young, 305 Stewart St., Peterborough, Ont.

MANITOBA

At the Canadian Medical Association convention at Victoria, Manitoba was represented by Dr. G. Henderson of Souris, Dr. W. A. Bigelow of Brandon, Dr. Harry Lewis of Angusville, Dr. W. Morrison of Gilbert Plains and eighteen doctors from Winnipeg including Dr. Chas. Hunter, Dr. J. R. Davidson, Dr. Gordon Fahrni, Dr. Gordon Chown and Dr. J. C. McMillan who were on the programme.

Before his recent departure for Texas where he will engage in fruit farming the following address was presented to Dr. Jasper Halpenny who for several years has been Professor of Surgery in the Faculty of Medicine, University of Manitoba.

To Jasper Halpenny, M.A., M.D., C.M., F.A.C.S.

Your friends of the medical profession of Winnipeg have learned with the deepest regret of your impending departure to reside in the United States, and that considerations of health have necessitated a change of residence. We cannot permit you to leave Winnipeg without giving expression to the esteem and admiration in which we have regarded both you and your work, and of saying that we consider that you have been a great benefactor of medical education; a wise and generous supporter of the Winnipeg General Hospital. You have always been foremost in assisting in the development of all worthy community interests, and especially the medical societies and the Medical Arts Building. You have been a notable friend and supporter of all good causes, and Winnipeg will be poorer because of your departure. At a time when courageous, clear headed leadership was a vital need in matters medical, you came to the fore and with wisdom, patience, and tact were a conspicuous factor in formulating and developing sound policy in the many organizations with which you have been connected.

We beg your acceptance of the accompanying gift, which we hope will often pleasantly recall to your mind your Winnipeg friends and associations, and will serve as an indication to yourself and to new friends and associates of the high regard in which you have been held by your professional brethren in Manitoba. We

wish you and the members of your family every happiness and success in your new environment, and we hope you may long be spared to afford inspiration and leadership to the community in which you propose to make your home.

Signed on behalf of

Winnipeg General Hospital, Geo. F. Stephens.
Manitoba Medical College, S. W. Prowse.
Medical Alumni Association, B. J. Brandson.
Manitoba Medical Association, J. D. Adamson.
Winnipeg Medical Society, J. D. McEachern.
Medical Arts Building, W. Harvey Smith.

Winnipeg, June 24, 1926.

On June 23rd and 24th, Drs. Stewart and Ross and Mr. McConnell of the Manitoba Sanatorium staff held a clinic at Portage la Prairie. Sixty patients, mostly children, were examined and x-ray pictures taken of all. The clinic was followed with interest by the local doctors. A similar clinic is to be held at Selkirk about July 20th.

Dr. M. Elliott (Man. '26) recently joined the sanatorium staff.

The many friends of Dr. D. F. McRae will be glad to know that he is making good progress under treatment at the Ninette Sanatorium.

Miss Jessie Grant, R.N., has assumed her new duties as Superintendent of Nurses of Winnipeg General Hospital.

Dr. H. C. McAlister, Winnipeg, is leaving on August 1st to take up new duties at the head office of the Lincoln National Life Assurance Co., Fort Wayne, Indiana.

Dr. S. F. Boyle left Winnipeg recently for Chicago where he will continue practice.

Dr. R. E. Alleyn having returned from post-graduate work in London and Vienna has opened an office in Winnipeg.

ROSS MITCHELL

SASKATCHEWAN

The first post graduate extension course as arranged through the Canadian Medical Association, was conducted in this province by Drs. E. H. Mason, Montreal, J. G. MacDougall, Halifax, and V. E. Henderson, Toronto.

They first addressed the members of the Northeastern Saskatchewan District Medical Society, at Yorkton. Clinics were held at the hospital during the afternoon and in the evening. Dr. Mason gave an address on "Diabetes", Dr. MacDougall on "The prostate," Dr. Henderson on "Therapeutics." There was a good attendance at both the afternoon and evening meeting, and the clinics and papers were much appreciated by the Society.

The visitors next addressed the Battleford District Medical Society at North Battleford, where they met a very large number of the medical men of that area. A clinic was held at the Notre Dame Hospital from 2.30 to 5.30 p.m., the cases presented being, "Dietetic treatment of typhoid fever," by Dr. Mason; a case of "Acute pancreatitis and the differential diagnosis of acute conditions in right upper abdomen," by Dr. MacDougall; and a case of "Xanthoma," by Dr. Mason. The guests and all members present were entertained at dinner at the Mental Hospital. In the evening Dr. MacDougall presented a paper on "Acute and chronic conditions of the

gall bladder," illustrated with lantern slides, and Dr. Mason a paper on the "Iodine treatment of the different types of toxic goitre," illustrated by a diagrammatic slide. Dr. Henderson's paper was on the use of drugs, such as, atropine, hexyl-resorcinol, tannic acid in burns, calcium chloride in high blood pressure, potassium chloride, adrenalin, etc. A short discussion followed. After the evening meeting all members and visitors were entertained by Dr. and Mrs. Hurlburt at their residence.

The next meeting was before the Prince Albert District Medical Society, all local men and a fair number of outside doctors were present. From 3.00 to 4.00 p.m. a clinic was held at Victoria Hospital when Dr. Henderson gave a talk on "Some of the more recent drugs," Dr. MacDougall gave a clinic on a case of "Myxo-sarcoma peritonei," and Dr. Mason discussed a case of "Diffusive pleurisy associated with a pan-carditis." Several local men took this opportunity of having a consultation on some of their more obscure cases. From 4.45 to 6.15 p.m., there was a second clinic at the Holy Family Hospital, when Dr. MacDougall discussed "Fractures," Dr. Mason a case of "Early pulmonary tuberculosis." After this the members were entertained at dinner and in the evening Dr. Mason gave a talk on "Glycosuria," Dr. Henderson on "Drugs," after which a general discussion

on "Blood pressure" followed. This meeting was a great success.

The next meeting was before the Saskatoon District Medical Society, where unfortunately the attendance was not as large as it might have been, but the papers and addresses were very much appreciated by those present.

Drs. Mason, MacDougall and Henderson next addressed the Weyburn District Medical Society, and in spite of roads being in bad shape there was a good attendance. Papers were delivered by each of the visitors and the members of the society were most enthusiastic in their praise.

The next meeting was at Moose Jaw where again there was a good meeting of the District Medical Society, and the addresses and discussions were enjoyed by all present.

The next meeting addressed was the Regina District Medical Society of which the secretary reports as follows:

At the June meeting held on the 14th, we entertained the last visiting Post-Graduate Lecture Tour. Dr. MacDougall of Halifax giving a very excellent paper on "Conditions associated with cystitis," Dr. Henderson of Toronto a very interesting paper on "The newer drugs," Dr. Mason of McGill an excellent paper on "The iodine treatment of the types of goitre." These were very excellent papers, and any members who failed to attend missed a series of valuable and very interesting addresses.

The last meeting of the tour was before the Swift Current District Medical Society, and their secretary reports as follows:

"The weather was very unfavourable as it rained all day and for that reason we had a rather poor attendance, nevertheless, we had a very profitable time, and our society was delighted with the work of the three men." There were clinics from 5 to 7 p.m., followed by a dinner at the Healy Hotel from 7.30 until 8.30, after which there were further clinics from 9.00 until 11.45 p.m. The local men had each a number of cases on which they wished to have a consultation, and advantage of this was taken by the visiting men to give clinics rather than lectures, with the exception of Dr. Henderson, who gave a talk on "Vitamines and endocrines."

From reports received from all district societies, the opinion is unanimous that the post graduate extension course has been most beneficial, and it is desired to express the appreciation and thanks of the several societies to the Canadian Medical Association, for arranging these post-graduate tours. The societies are looking forward with pleasure to the second course of lectures, which will be given in the near future. It is felt that as a result of these visits there will be a keener interest in the province. In addition, meeting men from other points in Canada does much to engender a better spirit throughout the medical profession.

A. MACG. YOUNG

The Regina and District Medical Society held their regular monthly meeting July 3rd, incorporating it with the visit of the Post-Graduate Lecture Team. Dr. Austen, of Queen's University, gave a paper on "The history of syphilis," Dr. Mullin, of Hamilton on "Insulin indiscretions," Dr. Fitzgerald, of Toronto University, "Scarlet fever." These were very interesting papers, and very useful to all present. As time goes on the great value of these lectures is becoming recognized more and more. An enthusiastic clinic was held in the Regina General Hospital in the afternoon.

Dr. M. M. Seymour our popular Deputy Minister of Public Health for Saskatchewan, has just returned from the International Meeting in Philadelphia, where he introduced a plan known as "The Seymour Plan" for active prevention of preventable diseases. At the last meeting of the Canadian Medical Association, Dr. Seymour was elected an honorary life member.

Dr. Chas. May has started practice in Regina.

Dr. David Low, of Regina, the immediate Past President of the Canadian Medical Association is chairman of the committee of the Canadian Medical Association appointed to work out the details and to implement the machinery for the standardization of all Canadian hospitals.

The Board of Governors of the Regina General Hospital is preparing to have a by-law submitted to the people for the much needed extension to the hospital.

Dr. C. E. Fran, leader of the opposition in the Provincial House has just returned from Seattle where he passed successfully the Washington State Board examination.

Dr. Tucker of Francis and Dr. Craig of Davidson were among the number from Saskatchewan who attended the Canadian Medical Association meeting in Victoria.

The Board of the Regina General Hospital has agreed to wait six months to give the Canadian Medical Association a chance to put through a Canadian Standardization programme before considering other standardization programmes.

The Saskatchewan members returning from Victoria report a very successful meeting and are enthusiastic about Victoria as a convention city.

We are pleased to hear that Dr. A. N. Hardy who has been out of the city for some two years is much improved in health and after a few months at Regina Beach, expects to resume his practice in Regina.

R. McALLISTER

ALBERTA

The Edmonton Academy held its regular meeting on May 12th in the General Hospital Lecture Room. The scientific section of the program was devoted to a paper on "Regional anaesthesia" by Dr. Petitelere, after which the meeting adjourned to the operating room where Dr. Petitelere operated on a case of appendicitis and double hernia, by spinal anaesthesia. The anaesthetic used was stovain (Billon). The operation was performed quite successfully with perfect satisfaction to the patient who is now fully recovered. Dr. Petitelere has operated by spinal anaesthesia in

150 cases with uniformly good results. Before operation he gives the patient $7\frac{1}{2}$ grs. Caffeine. To accommodate the large attendance of medical men, the operating theatre was fitted up temporarily with raised seats.

For the last month, the inoculation of school children by toxoid, for the prevention of diphtheria has been carried on vigorously, by the School Medical Department under Dr. Dunn, Medical officer of the School Board. In this work he has been generously

assisted by members of the Academy of Medicine, who have unanimously endorsed and recommended the procedure. It is hoped to have a large proportion of our school children immunized during the current year.

T. H. WHITELAW

Lethbridge doctors evidently believe in the old adage that "all work and no play makes Jack a dull boy," Dr. E. L. Connor spent a month holidaying with his old home folks at Windsor, Ont.

Dr. McNally has gone to England and France for three months part of which time is to be devoted to holidaying and part to post-graduate work.

Dr. Leech spent a month motoring to southern California and back.

Dr. Woodecock is away for two months, partly a motor trip to Ontario, and partly post-graduate work in Chicago, and other centres.

Dr. W. S. Galbraith was a candidate in the Provincial Elections but as he was not fortunate in being elected he may be able to salve his mind with the reflection that he has had a holiday. A change of work is often as good as a rest.

Dr. P. M. Campbell is spending a fortnight at his old home in Renfrew, Ont., intending to motor back.

Dr. W. W. Inkrote of Coalhurst, has been for six weeks, holidaying and doing post-graduate work in the eastern states. During his absence Dr. Chisholm, formerly of Raymond has been acting as locum tenens. Unfortunately the doctor contracted diphtheria, and is at present a patient in the Isolation Hospital in Lethbridge. When recovered, he intends to return east.

Dr. Astroff has located in Raymond.

The profession of Lethbridge and vicinity deeply sympathize with Dr. Lafferty, who sustained a great loss in the death of his wife, on June 7, 1926.

P. M. CAMPBELL

Dr. L. R. Gamey, who formerly practised at Killam, Alta., and left for Ontario four years ago,

has gone to Claresholm to be associated with Dr. Alex. McMillan.

Dr. A. B. Singleton, who recently underwent a serious operation, is around again to the delight of his confrères.

A conference is to be called in the immediate future to be composed of representatives of the College of Physicians and Surgeons of Alberta, and the Dental Association, to come to an understanding over the question as what amount of repair work on the teeth constitutes the practice of dentistry.

Dr. Allen S. Simpson of Saskatchewan, a graduate of McGill, 1901, has registered in the province.

Dr. E. V. Kershaw, a recent graduate of the University of Alberta, is locating at Gadsby.

Dr. Ralph Fitzgerald of Calgary, a McGill graduate of 1923, has just passed his primary examination for F.R.C.S., in London, England.

Dr. A. F. MacAulay, son of the late Dr. M. W. MacAulay of Calgary, was successful in passing the recent examinations of the Medical Council of Canada.

Dr. J. V. Follett of Calgary is visiting his boyhood haunts in Newfoundland, and we hope is enjoying some good fishing.

Dr. George R. Johnson, Registrar of the College of Physicians and Surgeons of Alberta, recently returned from Victoria, where he attended the special committee meetings of the Canadian Medical Association, on the subject of medical legislation. It is distinctly in the interest of the Dominion that medical legislation qualification requirements should be as nearly uniform throughout the Dominion as possible, and the wishes of the profession should be expressed in all the provinces.

In the recent provincial elections several medical men presented themselves as candidates, but the farmer wave was too strong, and all went down to defeat by the representatives of group government.

G. E. LEARMONTH

BRITISH COLUMBIA

The annual meeting of the British Columbia Medical Association was held at the Empress Hotel, Victoria, on June 22nd. The fact that the Canadian Medical Association was in session at the same time to some extent conflicted with the usual activities, but the Association had the pleasure of entertaining the members of council of the Dominion body at dinner in the evening, when some 125 men were present and a pleasant evening was spent. Dr. Stewart Cameron, of Peterboro, Ontario, was the guest of honour and spoke at some length regarding the history of the Ontario Medical Association; its difficulties and triumphs since its re-organization in 1918. Apparently the history of one association is very much like the history of another and it was with very sympathetic feeling that one listened to Dr. Cameron's account of the troubles out of which the Ontario Association seems to have eventually obtained a happy issue. He emphasized strongly, the advantages that have accrued to the Ontario profession as a result of their organization. When one hears of forty-seven district societies all running full blast with some

\$25,000 expended in five years upon extension work and post-graduate lecturing, smaller associations are apt to become envious. Nevertheless the British Columbia Association looks forward with optimism to the time when it, also, will have attained a similar degree of vitality.

The presence of Dr. G. L. Milne at the meeting in the afternoon and at the dinner afforded general pleasure. The British Columbia Medical Association has the right to nominate a certain number of honorary life members to the Canadian Medical Association when conditions as to age and duration of service are fulfilled. Dr. Milne who is already an honorary life member of the British Columbia Medical Association was our nomination for this year, and his election gave great pleasure to all our members. This pioneer of medicine in British Columbia claims seventy-five years of an active life, a great deal of which has been devoted to the service of his profession. He was one of the small devoted band that against great opposition was instrumental in bringing into effect the

Medical Act under which we now work. In speaking after his nomination Dr. Milne gave a brief account of the days in which he first practised in this province. "Truly there were giants in those days."

The election of officers took place following the dinner. Dr. J. H. MacDermot was elected President, Dr. Wallace Wilson, Vice-President, Dr. H. E. Ridewood, of Victoria, President-Elect, Dr. T. H. L. Lennie, Secretary-Treasurer, and Dr. M. G. Archibald of Kamloops, Dr. W. A. Clarke of New Westminster and Dr. E. R. Hicks of Cumberland were elected "members at large" on the Executive Committee.

We cannot let this occasion pass without tendering our hearty congratulations to the Victoria Medical Society for the truly splendid way in which they organized and carried out the programme of the annual meeting of the Canadian Medical Association. Those of us who remember the meeting here in 1906 can fully appreciate the difficulties of such an undertaking and considering the wonderful completeness of detail and the smoothness with which every detail was carried out one is filled with sincere admiration. "Fortune favours the brave" and no more delightful weather could have been prayed for by the Victoria medical men. Added thus to the natural advantages of Victoria one feels that the meeting of 1926 will long remain a mark to be aimed at.

The Fraser Valley Medical Society held its annual meeting on June 10th, when Dr. G. W. Sinclair of New Westminster was elected President, Dr. D. A. Clark of New Westminster, Vice-President and Dr. O. Van Etter, Secretary-Treasurer. At this meeting the question of changing the Royal Columbian Hospital training school to one of a graduate nursing staff was brought up but the doctors of the Fraser Valley Medical Society were unanimously in favour of continuing the training school. Professor Miller of the Department of Pathology, Queen's University, gave an interesting address before the society on cancer research which was highly appreciated.

Dr. D. J. Millar, Chief Medical Referee of the Workmen's Compensation Board of British Columbia, who resigned his position with the board, was, on June 30th, presented by the commissioners and staff with a slight token of their regard. Mrs. E. S. H. Winn, K.C., Chairman of the Board, made the presentation and remarked on the energy displayed by Dr. Millar during his term of office. He stated that the board always regretted the resignation of one of its staff and in wishing Dr. Millar every success in his new venture, trusted that his new field of labour would be more remunerative. Dr. Millar replied in suitable terms and expressed regret at severing his connection with the board. The presentation consisted of a smoker's cabinet, a case of pipes, together with a desk model B.D. sphygmomanometer. Dr. Millar is entering practice with Dr. C. R. Marlatt of Powell River after a period of seven years' service with the Workmen's Compensation Board.

The 1925 summer school of the Vancouver Medical Association will be held in the week of September

13th, and will last four days. There will be lectures in the morning and evening, with additional clinical demonstrations, arrangements for which will be announced later. The committee has been fortunate this year in obtaining particularly good speakers and this year's school gives every promise of being a great success. The lecturers will be: Dr. A. S. Warthin, Prof. of pathology, University of Michigan, Ann Arbor; Dr. Geo. Gellhorn, Prof. Obstetrics and Gynecology, St. Louis; Dr. C. A. Hedblom, Prof. of Surgery, University of Illinois; Sir Henry Gauvain, orthopaedic surgeon, London, England; Dr. Geo. Hale, Prof. of Medicine, Western University, London, Ontario; Dr. Fraser Gurd, Associate in Surgery, McGill University; Dr. R. R. MacGregor, Prof. of Paediatrics, Queen's University, Kingston.

Miss Donna E. Kerr, Biochemist of the Vancouver General Hospital Laboratories, recently made her 10,000th collection of blood, by venous puncture.

Dr. C. H. Vrooman and Dr. H. W. Hill, Director of the Vancouver General Hospital Laboratories, returned May 24, 1926, from the first of several trips to be made for the Federal Government, in the attempt to determine the incidence and factors of the tuberculosis amongst the British Columbia Indians. The first trip yielded first-hand clinical and fluoroscopic data concerning about 175 to 190 Bella Bella Indians. The examinations were conducted at the Large Memorial Hospital, Bella Bella, with the invaluable aid of Dr. George Darby, Medical Superintendent, and his staff of nurses.

Dr. A. W. Hunter, President of the Vancouver Medical Association and Pathologist to the Vancouver General Hospital, has tendered his resignation from the latter, taking effect July 1, 1926, in order to devote himself more completely to private practice. He will, however, remain as the consulting Pathologist. Dr. H. H. Pitts, originally of Nelson, B.C., at present and for some years past doing pathological work in Dr. Crile's clinic at Cleveland, Ohio, is to succeed Dr. Hunter, as part-time pathologist to the hospital. He is expected to begin his work here August 1, 1926.

Dr. R. E. Coleman, Assistant Director, was called away suddenly to Toronto at the end of May, on account of the illness of his father. Dr. Coleman returned on June 28th.

Dr. Guy Palmer who during the past few months has been practising at Merritt, B. C., has left for Ucluelet on the west coast of Vancouver Island where he will take care of the medical services at that place.

Dr. H. C. Wrinch of Hazelton is taking a three months holiday. Dr. Geo. More, of Nanaimo is relieving him.

Dr. W. J. Lightburne is relieving Dr. A. J. Stuart of Mission for two months as from July 1st.

Dr. B. Asselstine of Fernie is leaving this month for a six weeks' vacation in Nova Scotia.

UNITED STATES

MEETING OF ANÆSTHETISTS

The annual meeting of the Mid-Western Association of Anæsthetists will be held October 11 to 14, 1926, in Kansas City, Mo., on the same dates as the

Clinic Week in that city. The headquarters will be at the Baltimore Hotel. An attractive and interesting programme is in preparation. Any physician or dentist desiring to read a paper is requested to send

the title of his paper to the Secretary, Ralph M. Waters, M.D., 425 Argyle Bldg., Kansas City, Mo.

AMERICAN BOARD OF OTOLARYNGOLOGY

The next examination given by the American

Board of Otolaryngology will be held in Denver, Colorado, at the University Hospital on Monday, September 13, 1926. Application should be made to the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

Book Reviews

Collected Papers of the Mayo Clinic and the Mayo Foundation. Edited by Mrs. M. H. Mellish, H. Burton Logie, M.D., and Charlotte E. Elgen Mann, B.A. Volume XVII, 1925, published May, 1926. 1078 pages, illustrated. Philadelphia and London, W. B. Saunders Company. Toronto, McAlinsh & Co., Ltd., 1926.

This volume, as may be said of all its predecessors, is a compilation of papers setting forth the advance of medicine and surgery at the Mayo Clinic and the Mayo Foundation. It is definitely post-graduate in its material.

The first section, The Alimentary Tract, comprises some 314 pages, and has as its special feature very complete papers on liver function and jaundice. Blood chemistry studies in high intestinal obstruction and duodenal fistula, with outline of treatment, are presented and are certainly convincing. That stubborn disease, chronic ulcerative colitis, has been studied experimentally and a diplococcus isolated. Vaccines made from this organism, and iodine by mouth have given the best results yet obtained.

The section on urogenital disease contains papers on nephritis, prostatic obstruction, and carcinoma of the cervix uteri, all of which are interesting and instructive.

The section on ductless glands is largely occupied by diseases of the thyroid, and includes a paper on the early diagnosis of hyperthyroidism.

Following sections on the blood vascular system, the chest, brain, and spinal cord, there is a miscellaneous division containing a list of interesting titles.

It is difficult to apply just criticism to a book of this type, where one meets topics all the way from experimental studies to a citation of hard proven facts. Only time can prove the truth of any experimental work. There is a notable lack of surgical technique, and from the standpoint of the general practitioner only a fair amount on diagnosis. Considering the volume as a whole it is of high order, most instructive, and is certainly stimulating reading. R. V. B. SHIER

Points in the Diagnosis and Treatment of Tuberculosis and Cancer in the Larynx. Sir James Dundas-Grant, K.B.E., F.R.C.S., Consulting Surgeon, Central London Throat, Nose and Ear Hospital, etc. Price 1/6. 22 pages, 20 illustrations and 1 plate. H. K. Lewis & Co., Ltd., 28 Gower Place, London.

This brochure while primarily intended for the general practitioner, is equally useful to the specialist, as it brings the diagnosis and treatment of these diseases up to date, and does this in so lucid a manner, as to be a delight to read.

Once more the vital importance of prompt investigation by laryngeal mirror of simple hoarseness is pointed out—a caution that the general practitioner is slow to accept.

The differential diagnosis between laryngeal tuberculosis and cancer, so important in the early stage,

when malignancy can frequently be dealt with without mutilation, is carefully, fully, and yet simply elaborated. A comparison of the records of the Cancer and the Consumption Hospital by the author has revealed the startling fact that there is a comparative absence of cases of early intrinsic cancer of the larynx in the former, and a comparative frequency in the latter. "That at a cancer hospital these *eminently curable* cases should be absent shows that it is not yet sufficiently recognized that the *only symptom* in early intrinsic laryngeal cancer, the typical epithelioma of the vocal cord, *may be hoarseness.*"

While acknowledging the help which radiotherapy has brought to the treatment of cancer of the larynx, the author has no hesitation in insisting upon the value of an early operation. In skilled hands amazing results are being obtained, but the hands must be skilled. The dosage of the rays must be accurately defined before radiotherapy takes precedence of other measures.

Treatment of laryngeal tuberculosis has remained *in statu quo* for the last decade, and may be summarized as silence, vapours, and galvanocautery.

D. J. GIBB WISHART

Modern Medicine, Its Theory and Practice. Edited by Sir William Osler, Bt., M.D., F.R.S. Third edition, thoroughly revised. Re-edited by Thomas McCrae, M.D., assisted by Elmer H. Funk, M.D. Vol. I: Bacterial Disease—Non-bacterial Fungus Infections—the Mycoses. Vol. II: Diseases of Doubtful Etiology; Diseases caused by Protozoa, Spirochetes, and Animal Parasites; Diseases due to Physical, Chemical and Organic Agents; Deficiency Diseases. Vol. III Diseases of Metabolism; Diseases of the Digestive System. Six volumes and desk index, sold in sets only. (\$9.00 a volume; \$60.00 a set.) Lea & Febiger, S. Washington Sq., Philadelphia.

One gathers from Professor McCrae's preface that this system of medicine did not go through its third edition quite as a matter of course. It is easy to see why such writings do not lend themselves to continued republication, and it is pleasant to note the survival of this one under the capable editorship of Professor McCrae. We like to think that the father of the system at least stood on the threshold of its third rehabilitation, and cannot help reflecting on it as being to some extent yet another sign of the remarkable power which he diffused from himself.

Coleridge speaks of books being valuable as a motive for observation, and we would venture to apply the remark even to this which is itself so eminently a storehouse of observation. No part of it is so provocative of idea and comparison as is the opening essay by Sir William Osler on the evolution of internal medicine, an essay which the editorial genius of Professor McCrae has again fitted in as an introduction. No one is likely to sit down and read through the system, but everyone should sit down and read or re-read this introduction.

It is twelve years since the last revision; perhaps one of the more interesting comparisons to be made is in the section devoted to diseases of doubtful origin or unknown etiology. Scarlet fever is now placed amongst the bacterial diseases as a result of the final clearing up of its etiological problems by Dochez and the Dicks. Yellow fever also receives this type of promotion in consequence of Noguchi's discovery of the causal *leptospira icteroides*. It says much for the conservative judgment of the editors that typhus fever and measles still occupy their place in Volume II. This is not to say that the fullest consideration has not been given to the work which has been done in solving the problem of their etiology. A new article has been added on tularemia.

Epidemic encephalitis and botulism have become more prominent, and occupy a correspondingly larger space and the solid additions which have been made to our knowledge of the etiology of such conditions as erysipelas and bronchial asthma, are fully dealt with.

The second volume still presents its formidable list of diseases of unknown or doubtful origin, such as small-pox, typhus—on which Professor McCrae says so many of us have looked without seeing it—rheumatic fever, mumps, rabies, Rocky Mountain spotted fever, etc., etc. A new heading has been created for spirochaetal infections, and Sir William Osler's account of syphilis has been revised by Dr. Lewis A. Conner. A capital account of pellagra is given. It is placed under "Deficiency diseases" also a new heading, although Dr. Edward Jenner Wood points out that the cause is still regarded as unknown by the majority of observers.

A markedly convenient rearrangement has taken place in Volume III, not judging by differences in numbers of pages which never are necessarily an index to real loss or gain in a book, but by the better grouping of subjects. This volume now consists of sections devoted to diseases of metabolism and diseases of the digestive system. Rickets and scurvy have been transferred to the above mentioned new section of deficiency diseases and ample room has thus been allowed for describing the developments in connection with diabetes which have arisen from the discovery of insulin. Sprue is described in a separate contribution by Dr. Jenner Wood.

In no instance can it be said that the plan of the new edition has departed from the idea so steadily adhered to by Sir William Osler, i.e., that the work must be adapted to the needs of the general practitioner. It carries with it all the qualities of the best modern medical writing.

H. E. MACDERMOT

Methods and Principles of Teaching the Principles and Practice of Nursing. Bertha Harmer, B.Sc., (Columbia University) R.N. 136 pages. The Macmillan Company, Toronto, 1926.

In "Methods and Principles of Teaching the Principles and Practice of Nursing," we have certainly the most important text for instructors in schools of nursing, that has yet appeared in the field.

The text is divided into three sections. Section I, "The aims of the course"; Section II, "The content of the course of study," and Section III, "Methods of teaching, and learning by practical experience."

In Section I, the author states that "Nursing" is the heart of the whole curriculum; the object for which all the other courses are being given. There is special emphasis on "Teachers' Aims," the aim of including in the course of study, those principles and methods, which will control, direct, and make experience intelligent, so that the students may render sympathetic, intelligent and skilled nursing care to the patient, not only in the hospital ward, but also

in the community. The summary appended to this chapter is a valuable addition for a rapid review or reference.

In Section II, Miss Harmer explains very explicitly that "The Content of the Course of Study" should be such as to meet the needs of the patient, and the educational needs of the nurse, and that the one should not be separated from the other. She also emphasizes the desirability of making a "job analysis" of the duties, difficulties, and problems which the students will meet with in their practical experience.

Section III, is devoted to an exposition of the "Methods of Teaching." Dr. Thorndike's Laws of Learning are quoted, and the author explains very clearly how they can be applied to nursing. The "Project Method of Teaching" is well explained and illustrated. Finally, there is a plan of teaching a lesson in the "Principles and Practice of Nursing," the method of using case studies, and the use of text and reference books. The subject matter contains an abundance of rich material, which is presented in a clear and interesting manner. It is really an educational programme for schools of nursing. Illustrations of individual "Practice Cards" and "Efficiency Records" are used throughout. Superintendents, instructors and supervisors will, we believe, find this volume invaluable.

M. BATSON, R.N.

Text-Book of Public Health. E. W. Hope, O.B.E., M.D., D.Sc. and C. O. Stallybrass, M.D., D.P.H., O.S.S. 9th edition. 340 pages, illustrated. Price \$4.50. The Macmillan Co. of Canada, St. Martin's House, Toronto, 1926.

This work on public health contains much useful information and is presented in such a way that it makes for the most part interesting reading. It covers the whole field of public health work.

In the first chapter is taken up legislation with reference to public health work applying especially to the British Isles, quoting the numerous amendments to the Health Act up to date. It corresponds closely with health regulations in this country but there are some differences.

Under the headings climate, site, soil and vital statistics these subjects are dealt with very fully and contain much valuable information but with many of the points brought out the medical officer of health in this country is not required to deal.

The chapters on pure food, water, sewage and sewage disposal contain much practical information useful to any person interested in public health work and more especially to those employed in the work or preparing for such work.

Infectious diseases—their causes, methods of infection, preventive care, hospitals and disinfectants—are all carefully presented.

Pre-natal care of the expectant mother, child welfare, health of the school child and hygiene are explained and much useful information on these subjects is given.

On the whole the book would be most valuable for a medical officer of health as a book of reference. It would also be of much use as a reference work to the general practitioner. It perhaps goes into details rather too definitely for the ordinary student.

D. GOW

Reluctantly Told. Jane Hillyer. Introduction by Joseph Collins, M.D. 205 pages. Price \$2.00. The Macmillan Company, Toronto, 1926.

The instructive introduction by Dr. Collins is no mean contribution to the book itself. The author relates her experiences in the course of a few years in sanatorium and asylum when she was suffering from

Vitamins Essential

to the Health of the Mother & Child

FOOD values are no longer decided by Chemical Analysis alone. Growth and development, the maintenance of the defensive powers of the body against the germs of disease, and freedom from Rickets have been demonstrated beyond doubt to be dependent on the food containing those vital qualities known as Vitamins.

Important investigations conducted at the Bio-Chemical Laboratories of the University of Cambridge have demonstrated that the Vitamins so rich in the foods of which Virol is composed are not destroyed in the process of manufacture, but are found in their active state in the preparation as it reaches the public.

More than 3,000 Hospitals, Sanatoria and Infant Welfare Societies are regularly using Virol.

VIROL

VIROL LTD., HANGER LANE, EALING, LONDON, W.5.

Sole Importers: Bovril Limited, 6201 Park Avenue, Montreal

Sales Agent: Harold F. Ritchie & Co. Ltd., 10 McCaul St., Toronto

a condition which was diagnosed as dementia præcox but which in all probability was a manic-depressive psychosis of the mixed type. Her recovery was complete leaving no trace of dementia. Dr. Collins assures us, though the book itself written after the event, is ample assurance of this. It is obvious that we have here to do with a young woman of decided literary ability, keen insight, remarkable powers of observation, a beautiful style—and a distinct “flair” for her subject. Consciously and unconsciously she builds up a frame-work of earlier reminiscences which to the expert mind foreshadow her ultimate breakdown almost as inevitably as the workings of fate in a Greek drama. Her description of the ensuing years of alienation is observant, and vivid and depicts the variations of her moods and behaviour in a very convincing manner, whilst her sidelong comments and indirect references to the management and treatment and the medical and nursing staffs in an insane asylum are often more suggestive and illuminating than many a more direct statement have been. We have here the study of a “mind diseased” by that mind itself, clearly written down after recovery—a study of an aberrant mind by the sufferer herself, which is obviously true to type and therefore very instructive to the alienist, and such good subjective studies of the mechanism of mental malfunction though desirable are very rare in medical literature. As the book is so readable and non-technical in manner, with a fine delicacy without obscurantism when treading on doubtful ground it might be read with interest and profit not merely by those interested in medical and sociological questions, but by laymen in general.

NORMAN VINER

Pediatrics. By Various Authors. Edited by Isaac A. Abt, M.D., Professor of Diseases of Children, Northwestern University Medical School, Chicago. Complete in 8 volumes and index, fully illustrated, 1102 pages. Price per set \$88 00. W. B. Saunders Company, London and Philadelphia, McAinsh & Co., 12 College Street, Toronto, Canada, 1926.

This volume, with the index, completes this encyclopedic work under the editorship of Dr. Abt, which has been appearing at intervals during the past two years. The first two hundred and fifty pages of this volume, profusely illustrated, must be regarded as a concise text-book on all the numerous diseases of the skin, and its appendages to which children are liable. Ear disease in childhood is fully discussed, and especially its occurrence during the course of the infectious fevers. Diseases of the eye in infancy and early childhood are described; a special chapter is devoted to the examination and care of the eyes during the school age. Two hundred pages of the volume are occupied with a description of the construction, equipment and management of a children's hospital. A well written pathological discussion on “Tumours of infancy and childhood” occupies another chapter. The various forms of encephalitis are described; and epidemic encephalitis and its essential pathology fully depicted. The final one hundred and fifty pages are devoted to a description of the various animal parasites that infect the human species. The various forms of helminthic infections are fully presented, and well illustrated.

If one might offer a criticism it is that the authors have attempted to perform too much. It would appear to be questionable whether a text-book for the general practitioner should be burdened with a chapter on the architecture of children's hospitals, when such information can be secured from standard works. It adds however to the encyclopedic character of the work. Needless to say the work is very complete.

The index will appear in a separate volume.

R. R. STRUTHERS

The Clinical Interpretation of the Wassermann Reaction. Robert A. Kilduffe, A.B., A.M., M.D. 203 pages, illustrated. Lea & Febiger, Philadelphia and New York, 1926.

In this little book the author reviews the Wassermann reaction in a clear and careful manner. The technique of the reaction is discussed and the latest and best methods described. Kolmer's method is preferred. The value of the test in all phases of syphilis is considered. A plea for closer co-operation between the physician and the pathologist is very timely. In presenting to physicians an aid to the clinical interpretation of the test, it should do a great deal to clear up misconceptions. W. P. McCOWAN

The Bacteriophage and its Behaviour. F. d'Herelle. 629 pages. Price \$8.00. The Williams & Wilkins Co., Baltimore, 1926.

This book offers a review of all the work done on the bacteriophage by the author and others. It bears evidence of the already extensive investigations this interesting and difficult problem has received (almost entirely at the hands of foreign workers) since the author published his original volume. The book is divided into three parts dealing with the phenomenon, with the nature, and with the behaviour of the bacteriophage. As may be expected considerable space is devoted to the detailed description of the technical investigations; a feature that will be appreciated by laboratory workers. The author extends his original arguments as to the living nature of the bacteriophage, and throughout, the text contains many statements that are emphatic if not dogmatic. However, d'Herelle supports his statements with experimental evidence and he challenges the scientific world to justly evaluate his theories. The chapters on the behaviour of the bacteriophage in disease deserve attention. A new field of specific and immune therapy is discussed and success is reported in the immunization of the buffalo against barbone and of the fowl against infection with *B. gallinarum*. Not so convincing in our opinion are the chapters devoted to the discussion of specific therapy by means of bacteriophage suspensions. The results, however, obtained by phagotherapy in bacillary dysentery, in typhoid, colon bacilli and staphylococci infections, and in infected wounds are explained and summarized. The volume will be welcomed by the scientific world. It throws more light, from an authoritative source, on this important and complex biological problem. FRED. CADHAM

History of the Psychopathic Hospital, Boston, Mass. L. Vernon Briggs, M.D. and Collaborators. 222 pages, illustrated. Wright & Potter Printing Co., 32 Derne St., Boston.

The history of an institution is not only the recounting of events in their correct chronological sequence. Far more, it is the story of an idea, how, when and in whom it originated, its growth and its fruition. Even as with the children of men, institutions—the children of men's minds—have their prenatal, natal and post-natal difficulties. Dr. Briggs and his collaborators, all of whom have a right to speak and to be heard, tell in this little book how that great institution the Boston Psychopathic Hospital came into being, with what travail its birth was attended and its early years beset.

Dr. Briggs himself tells the story of the steps leading up to the actual opening of the hospital. His account bears the marks of unmistakable pride in the achievement. The course was not all smooth sailing and it is evident that Dr. Briggs has not yet forgotten the sorrows and exasperations he encountered by the way. This section is very fully documented, the various letters and legislative enactments showing

HOW MUCH IS A DROP?

*A Special Precision Dropper accompanies each
one ounce bottle of*

TINCTURE NO. 233 DIGITALIS

(fat-free)

"Frosst"

Physiologically Assayed and Standardized

* *THIS DROPPER is constructed to deliver two drops to the minim* *
* *of the tincture at ordinary room temperature. The importance of a* *
* *uniform dropper will be appreciated when one realizes that ordinary* *
* *droppers from various sources deliver anywhere from 40-60 drops* *
* *of tincture digitalis to the cubic centimeter (17 minims).* *

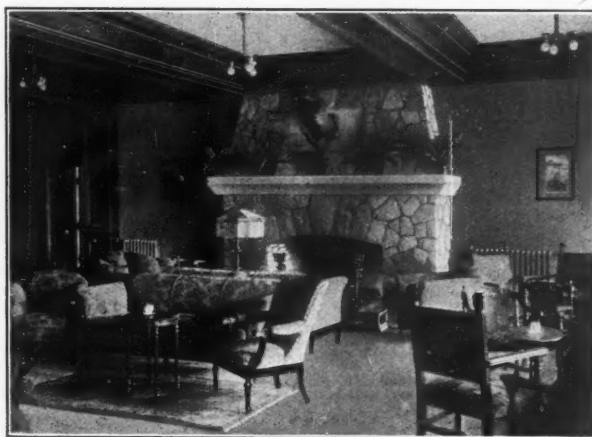
When prescribing Tincture No. 233 Digitalis (Frosst) it must be remembered that two drops are the equivalent of one minim when dropped from our standardized dropper.

Charles E. Frosst & Co.

MONTREAL, CANADA

Manufacturing Pharmacists since 1899

*Splendid
Golfing
facilities
also Bowling,
Riding,
Tennis
and all
outdoor
games*



*Especially
suitable for
Convalescence
from Illness,
Rheumatic
Conditions
and
Chronic
Fatigue*

THE PRESTON SPRINGS HOTEL, - PRESTON, ONT.

Attention is directed to the excellent facilities offered by the Preston Springs for the entertainment of guests, requiring Electro and Hydro Therapeutics under experienced medical supervision.

Write to Preston Springs Hotel, Preston, Ontario, for rates and booklet

very clearly where resistances lay and how they were overcome.

Part II, devoted to organization and operation contains informative chapters on the administrative problem of the hospital, the Out-Patient Department, the Social Service, the Alcoholic Club, the Nursing and Occupational departments, the work on neurosyphilis. Dr. Canavan contributes a chapter on the work of the medical director. Her long and faithful service with Dr. Southard, the hospital's first director, qualifies her to give a detailed and sympathetic account of his aims and ideals, his constant efforts to achieve them and above all his unique power to stimulate and inspire others. The final chapter is a thoughtful exposition of the function of trustees by Dr. Albert Evans. Block and floor plans of the hospital are appended.

Those who devoted themselves to the cause will here find a faithful record of their devotion. The hundreds of physicians and social workers throughout the United States and Canada who look back gratefully upon a period of work at the Psychopathic Hospital, will here find further reason for their esteem and respect. To those engaged now or later in hewing out a similar path in their own community, the story here given will be a chart, and guiding star.

A. T. MATHERS

The Endocrine Organs. An Introduction to the Study of Internal Secretion. Sir E. Sharpey-Schafer, LL.D., D.Sc., M.D., F.R.S. Second edition. 414 pages, illustrated. \$7.00. Longmans, Green & Co., New York and Toronto, 1926.

The study of endocrinology is developing and extending so rapidly that any set publication such as the one under review starts most probably with the expectancy of a brief useful life. We are at the moment overwhelmed with a mass of detail derived from all possible lines of attack so that to the average observer the situation is confused, while to the individual worker there is always the risk of developing a restricted outlook. Under these circumstances more than one author has yielded to the temptation to clear the air by resolving the tangled threads into an attractively integrated endocrine system. This is done largely by hypothesis and conjecture. No such attempt is made in this book.

The justification of the present edition lies in the urgent necessity of taking stock from time to time of established evidence. There are few, however, who are both willing and competent by experience and outlook to undertake the prodigious task of sifting that evidence and assessing values. It is fortunate therefore, that the work has been undertaken by Professor Schafer. No matter what the development of the subject may be, this book will be invaluable to all interested as an authoritative exposition of our present position.

Each organ is dealt with separately though of necessity reference to inter-relationship occurs throughout. The terminology earlier suggested by the author is retained despite some pressure against its adoption. Thus the actual specific secretions are known as "autacoids", and those of them whose action is inhibiting are termed more precisely "chalone". "Hormone" thus becomes restricted as a term to an autacoid which is excitatory in effect. Of the 238 pages 143 are devoted to the pituitary body. This is, however, no evidence of neglect. The book, in fact, though exceedingly comprehensive is highly concentrated. The manifest danger in such consolidation is avoided by the unflinching clarity and attractiveness of the text. All avenues of approach to the problem—anatomical, histological, embryological, physiological and so on—are fully dealt with, and, while of necessity much of the material is derived from experimental work on lower animals, the clinical, pathological

and therapeutical contributions are carefully reviewed. References are abundant in the form of footnotes, and as is usual in publications by the author the illustrations of microscope preparations and the reproductions of graphic records are well chosen, clear and amply annotated.

It is a commentary on the progress in endocrinology that opportunity is taken in this part to insert certain additions applicable to Part I published only two years ago.

G. SPENCER MELVIN

The Comparative Anatomy, Histology, and Development of the Pituitary Body. G. R. de Beer, M.A., B.Sc., F.L.S. 108 pages, illustrated. Price 12/6. Oliver & Boyd, 33 Paternoster Row, E.C., 1926.

In view of the important position occupied by the pituitary gland in endocrinology, one welcomes a volume (even though small) dealing with its comparative anatomy and histology. After an introductory chapter dealing with the histological methods that were utilized, the writer proceeds to the description (both macroscopic and microscopic) of the gland in mammals, his idea presumably being to conduct the reader over familiar ground first of all. Throughout the book emphasis is laid on the fact that the pituitary is a complex organ, more so than is generally suspected. This point is brought out by a study of the anatomy of the gland throughout the whole vertebrate series. Certainly an investigation into the subject in all these divergent types seems to demonstrate that a correlation of the various component parts of the gland frequently presents difficulties.

The author's main intention is to homologize the four component parts of the typical mammalian pituitary body in all the vertebrate groups by enlisting the services of histology and embryology as a means to that end. The importance of this knowledge to the investigator and the clinician is obvious, for it would be manifestly impossible to separate or isolate the various active principles created by the gland without a clear conception of its comparative anatomy.

The book is liberally illustrated by plates (one coloured) and diagrams. The concluding chapters on the evolution and comparative anatomy of the gland are suggestive. There is a useful bibliography. The index might with advantage be extended somewhat. This book though small is to be regarded as a preliminary announcement, since the possibilities of the subject are immense.

JOHN CAMERON

Emergency Surgery. George De Tarnowsky, M.D., F.A.C.S., D.S.M., Professor of Clinical Surgery, Loyola University Medical School. 718 pages, illustrated. Price \$7.50. Lea & Febiger, Philadelphia & New York.

This volume is devoted exclusively to the surgery of wounds. As its sub-title "The Military Surgery of the World War adapted to Civil Life" indicates, the author has endeavoured to apply the lessons of the Great War to the surgery of civil life and more particularly to industrial surgery.

In an excellent chapter on the protective forces of nature, the view is expressed that infection, in the majority of cases, results not so much from the introduction of virulent germs from without, as from the lowered resistance of the injured tissues and the increased virulence of the common saprophytic bacteria; and, as a corollary, the importance of thorough removal of injured tissue and the mobilization of the defensive forces of the body are emphasized. Not much reliance is placed upon the use of antiseptics including Carrellization. Throughout the book the space devoted to penetrating wounds is large, in comparison to that given to the non-penetrating variety which is much the more common in civil practice. This is especially true of the chapter on head injuries in which a fuller discussion of the indications for and

BOND INVESTMENTS

ELGIN 1341-2

CORRESPONDENCE INVITED

FRY, MILLS, SPENCE & CO.

DOMINION BANK BUILDING

TORONTO, 2

S. John's House of Rest

[Sisters of S. John the Divine].

EGLINGTON, N. TORONTO

For the Convalescent. For the Fatigued
Nervous Woman. For the Tired Business
Woman who wants a quiet week-end.

A thorough rest, with every care, in modernly
equipped home, ideally situated in beautiful
surroundings. Moderate Rates.

Full information on application to

The Sister-in-Charge, S. John's House of Rest
R. R. No. 1, Eglinton, Ontario

A Doctor's Office for rent, with equipment. Good location in
small progressive city within easy access to Toronto. Office has
been occupied by the one Doctor for over thirty years. Apply Box
65 C.M.A. office, 836 University Street, Montreal.

Experienced Edinburgh graduate, with Ontario License, wishes
salaried position in or near Toronto, or a sure-money location near
there. Highest recommendations, abstainer. Apply Box 64, C.M.A.
Office, 836 University Street, Montreal.

STENOGRAPHER

Canadian, desires position as Doctor's Secretary or Stenographer
in Hospital. Conversant with medical terms, having had two years'
experience in a U.S. Hospital Record Department, which is on the
accredited list of the American College of Surgeons, and also has
had bookkeeping experience. Best of references. Apply "Secretary",
123 Woodbine Ave., Toronto, Ontario.

Hot Weather Intestinal Disorders

meet with dependably effective correction under
the healing, aseptic action of

ANGIER'S EMULSION

- Fermentation and putrefaction are controlled
- Irritation soothed
- Diarrhea arrested
- Evacuation regulated
- Proper assimilation facilitated
- Nutrition promoted and a
- Normal condition rapidly restored

Trial bottles to prove it sent on request

Canadian Distributors:

Wingate Chemical Company, Ltd.
Montreal, Canada

Angier Chemical Company
Boston 34, Mass.

against operative interference in the non-penetrating variety would be welcome. The use of lumbar puncture as a means of ascertaining the degree of intracranial tension is not mentioned. A well illustrated chapter on splints is one of the best in the book. The splints found most useful by the military officers of the war, are here described in detail. The sections dealing with the surgery of the extremities present a wealth of material obtained from war records, and from the inter-allied surgical conferences. The final chapter of seventy-five pages discusses the medico-legal aspect of emergency surgery and contains much interesting and useful information regarding the regulations of workmen's compensation boards in the different states.

In this work much new and important matter appears for the first time in book form. It is presented in a style that is concise yet always clear, and the arrangement under heavy type headings is unusually well suited for easy reference. The omission from the book of a consideration of non-traumatic emergencies such as the lesions underlying the acute abdomen and some other urgent conditions, should be corrected in a second edition, if the title "Emergency Surgery" is to be retained.

JAMES MCKENTY

Simplified Infant Feeding. Roger H. Dennett, B.S., M.D. Third edition. 415 pages, illustrated. Price \$5.50. The J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1926.

This well-known book has been revised and in many places helpful additions have been made. It is essentially a book for the general practitioner and is particularly valuable because of the detailed instruction which is given for the treatment of ordinary feeding cases.

The influence of German teaching is evident, particularly that of the Finkelstein school, and it is interesting to note the American additions that have been made to the Finkelstein teaching.

The illustrations are fairly plentiful and clear.

As an example of the sort of detailed instruction that is contained in the book a definite description of the tablespoon is given, and Dennett says that the size of the regular tablespoon should be 2 and 7/8 inches long, and 1 and 3/4 wide.

On the whole it is felt by the reviewer that this book will supply the general practitioner with as much practical infant feeding knowledge as he will ordinarily require.

H. P. WRIGHT

Abt's System of Pædiatrics. Vol. vi. By various authors. Edited by Isaac A. Abt, M.D. Price \$11.00. W. B. Saunders, Co., Philadelphia and London; Canadian Agents, the J. F. Hartz Co., Toronto, 1925.

The sixth volume of Abt's System of Pædiatrics is devoted almost entirely to infectious diseases. The different conditions are ably handled by recognized authorities and more than usual attention has been paid to the differential diagnosis and treatment; this fact should be of special interest to the general practitioner. Particularly complete and instructive are the chapters on diphtheria, scarlet fever, and epidemic meningitis. One regrets that this volume was published so soon after the introduction into pediatric practice of the epochal contributions of Dick and Schick, that it has been impossible to cover the more recent work on diphtheria and scarlet fever.

The numerous photographs and charts are well selected and not intricate. One can find little in the work to criticize, the only important omission being the failure to describe the "duct sign" in the chapter on mumps. Taken as a whole, the volume should be of the greatest assistance to both the general practitioner and the specialist and can be thoroughly recommended.

EDWARD A. MORGAN

Experimental Pharmacology—Meyer and Gottlieb. English translation from the seventh German edition by V. E. Henderson. 656 pages. Price \$7.50. J. B. Lippincott Co., Unity Bldg., Montreal, 1926.

This text-book has been for some time very popular with the German profession, having passed through seven revisions in fifteen years. The subject of pharmacology is presented from a physiological viewpoint. The book contains eighteen chapters which for the most part begin with a brief review of the physiology of the organ, or system under consideration. The authors are chiefly concerned with pharmacological reactions which have a practical application in the treatment of disease or disordered functions. There is considerable discussion of scientific investigation bearing on the various groups of drugs, and a very complete list of references. The method of presentation closely relates pharmacology to medical practice, and will prove of great assistance to the practitioner.

Professor Henderson has rendered the German text into very excellent English. The scientific names and doses of the British and United States Pharmacopœia have been substituted for those of the German Pharmacopœia occurring in the original text. This volume will prove a very useful addition to every student's library and should stand among the reference books of every physician who seeks a scientific basis for the administration of drugs.

W. E. MACKENZIE

Contributions to Ophthalmic Science by Various Authors. 313 pages, illustrated. George Banta Publishing Co., Menasha, Wis., 1926.

This work, a collection of articles upon various topics, abstruse and practical, with a number of case reports of exceeding interest, contributed by admirers of Edward Jackson, an outstanding teacher of ophthalmological science, first in Philadelphia and afterward in Denver, to honour his seventieth birthday, is almost unique in ophthalmological literature. Surely it has fulfilled the desire of its originators for it is full of scientific lore, and excellent teaching.

The full table of contents is too long to re-print here. Such subjects as, The cataract operation of election; The management of incipient cataract; Lens opacities in diabetic patients, are discussed in an eminently practical way; reports of unusual conditions, e.g., massive gliosis of the retina; nodular degeneration of the cornea; and discussions of physiological problems associated with vision, such as, macular acuity of vision and macular perception; studies in ocular fatigue, and others, make a programme which will appeal to some interest in every ophthalmologist.

Out of its perusal, one is sure to get new knowledge; new aspects of subjects which are already familiar, and a new measure of enthusiasm.

The idea behind its publication, and the practical fulfillment of the design deserve unstinted praise.

The book is attractive in appearance; the printed page easily read and the illustrations excellent.

FRANK C. TREBILCOCK

The Surgical Clinics of North America. Vol. vi, No. I, (Philadelphia Number). Six volumes per year. Yearly subscriptions only. Price \$16.00 (cloth binding). London & Philadelphia, W. B. Saunders Co. Canadian Agents, McAlmsh & Co., Toronto, February, 1926.

Among the numerous valuable articles in the Philadelphia Number,—the one on spinal anesthesia is deserving of special mention; useful details of technique are introduced in the discussion of various cases. A preliminary report on cystocoele and prolapse as studied by cystograms is unusually well illustrated and suggests interesting clinical possibilities. The last thirty pages are devoted to a "Fracture symposium" which is alone well worth the price of the book.

L. H. McKIM